APR 23 1925 Medical Lib.

Vol. IX APRIL, 1925 No. 4

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY

ADVISORY EDITORIAL BOARD

CHANNING W. BARRETT
C. L. BONIFIELD
J. WESLEY BOVEE
W. W. CHIPMAN
JOHN G. CLARK
H. S. CROSSEN
THOMAS CULLEN
EDWARD P. DAVIS
J. B. DeLEE
ROBERT L. DICKINSON
PALMER FINDLEY
ROBERT T. FRANK
GEORGE GELLHORN
ALBERT GOLDSPOHN
WILLIAM P. GRAVES
HERMAN E. HAYD
BARTON C. HIRST
E. J. ILL
J. C. LITZENBERG
F. W. LYNCH
FRANKLIN H. MARTIN
C. JEFF MILLER
GEORGE CLARK MOSHER
HENRY P. NEWMAN
GEO. H. NOBLE
REUBEN PETERSON
JOHN OSBORN POLAK
F. F. SIMPSON
HENRY SCHWARZ
J. M. SLEMONS
HOWARD C. TAYLOR
THOMAS J. WATKINS
B. P. WATSON
GEORGE GRAY WARD
J. WHITRIDGE WILLIAMS

OFFICIAL ORGAN OF
THE AMERICAN GYNECOLOGICAL SOCIETY
THE AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS
NEW YORK OBSTETRICAL SOCIETY; OBSTETRICAL SOCIETY OF PHILADELPHIA; BROOKLYN GYNECOLOGICAL SOCIETY; AND ST. LOUIS GYNECOLOGICAL SOCIETY

GEORGE W. KOSMAK . . . . . Editor
HUGO EHRENFEST . . Associate Editor

PUBLISHED BY C. V. MOSBY COMPANY, 508 NORTH GRAND BLVD., ST. LOUIS, U. S. A.
Entered at the Post Office at St. Louis, Mo., as Second Class Matter.

BARD-PARKER KNIFE

It's Sharp

A new, keen clean blade for each operation

BARD-PARKER CO., 150 Lafayette Street, New York, N. Y.

An Effective Physiological Hemostatic

KOCHER and FONIO of Bern, have convincingly demonstrated the superiority of the blood platelets as the source of therapeutic thrombokinase.

Coagulen-Ciba
(Kocher-Fonio)

when applied locally, given by mouth, or injected subcutaneously, intramuscularly or intravenously stops internal hemorrhage or oozing from small vessels. Secures a bloodless operative field, prevents secondary hemorrhage, without irritation, devitalizing tissue or inducing sensitization or anaphylaxis.

Invaluable in metrorrhagia, post partum hemorrhage, abortion, placenta praevia, perineal rupture, vesical hemorrhage, melaena neonatorum, etc.

Acts in from 5 to 10 minutes. Lasts from 8 to 10 hours.

Issued in powder, in bottles of 2½, 5 and 10 grams.
In ampules containing 20 c.c. of 3% solution in cartons of 1.
In ampules containing 1.5 c.c. of 3% solution in cartons of 5.

Scientific Literature and Clinical Evidence on Request.

CIBA COMPANY
INCORPORATED

142 Washington St. **NEW YORK CITY**

The American Journal of Obstetrics and Gynecology

VOL. IX ST. LOUIS, APRIL, 1925 No. 4

Original Communications

CONTRAINDICATIONS TO THE USE OF RADIUM IN GYNECOLOGY*

BY WILLIAM P. GRAVES, M.D., BOSTON, MASS.

IN the enthusiasm that follows the advent of so brilliant a remedy as radium there is danger of overestimating its field of usefulness and of regarding too little its possibilities of doing harm.

The purpose of this paper is to emphasize certain dangers with which the use of radium is attended in gynecologic practice and to discuss its indications and contraindications in various conditions in regard to which there is at present a division of opinion.

The particular dangers of radium in gynecologic cases, are only too familiar to those experienced in its use. These dangers have been to some extent brought to the attention of the general profession, but are almost unknown to the laity who, deriving their information from unreliable sources, see in radium only a miraculous and harmless remedial agent.

A clear realization of the dangers of radium is of greatest importance to those who are employing it as beginners, of whom there is at present a large and rapidly increasing class. Where radium is owned by hospitals it has been, as a rule assigned to selected members of the staff many of whom have wisely taken a preliminary course of instruction in its use. Under such conditions comparatively little harm has been done, treatment having been given by men who possess a competent clinical knowledge of the diseases with which they are dealing. In view however of the great increase in private ownership

*Read (by invitation) at a meeting of the Obstetrical Society of Philadelphia, May 1, 1924.

NOTE: The Editor accepts no responsibility for the views and statements of authors as published in their "Original Communications."

of radium, and of the institution of distributing centers from which radium emanations may be secured, there is cause for fear that its use may become too indiscriminate and productive of harm.

It is not in any sense the desire of the writer to discourage the wide distribution of a remedy so beneficial to mankind as radium, but merely to aid in calling attention to both physician and patient that radium is a powerful agent with destructive properties that are capable of serious or even fatal results.

The misuse of radium has not so far as I know led to any definite legal regulations, but such an event is certainly within the range of possibility. In order to avoid restrictions that might be undesirable it is necessary that those who are employing radium should exercise the greatest caution in its application and should be frank in reporting evil as well as good results.

The practitioner who is contemplating the treatment of patients with radium, should thoroughly realize at the start that the most complete knowledge of the physical properties of radium and the most elaborate equipment do not justify him in treating diseases with which he is not clinically perfectly familiar. He should realize, for example that cancer is not a distinct disease by itself which is subject to standardized methods of treatment; but that it is merely a generic term to define malignant changes that take place in many different tissues. Cancer is merely a collective expression that includes as many distinct clinical diseases as there are organs which it attacks. Each of these diseases is a particular entity, differing from the others in its tissue reactions, its methods of metastasis, its anatomic relationships, its amenability to radium or surgery, and in many other ways. Moreover cancer appears in manifold types each of which exhibits specific variations in the organ in which it is located. An adequate knowledge therefore of all the organ-cancers in the body is requisite for the universal radiologist who is setting out to treat cancer in general.

Furthermore in undertaking so important a vocation he should be familiar with the treatment of organ-cancers by other means than radium. Until the advent of radium, cancer had been preeminently a surgical disease. Although radium has done wonderful things, and in some cases accomplishes what surgery cannot, nevertheless it has not supplanted surgery by any means, nor at present indications is it likely to, desirable as such an outcome might be. There are occasions, even in treating those lesions in which radium is most efficient when operation is the procedure of choice, and there are many other conditions in which radium is imperatively contraindicated, in favor of surgery.

It would seem therefore that the radiologist should possess not only a thorough knowledge of the pathology of the organ-disease

which he is treating but also the ability to treat it surgically if need be.

Of no small importance is the technical expertness necessary for making applications of radium in the various cavities of the body that give access to specific organ-cancers. It is a grave mistake to suppose as some do that the technical use of radium is a simple matter and one easily learned. On the contrary, the skill necessary for properly applying radium to some organs is quite comparable to that required for surgery of the organ. When one hears of an inexperienced operator undertaking to treat cancerous disease in general with irradiation, one wonders what work will be made of those instruments used in manipulations of the bladder, vagina, nose, throat, etc., skill in which it has required the specialist years to acquire. It is not uncommon even to see mistakes of omission or commission made because an operator has had insufficient skill to remove tissue for microscopic examination. It is as blameworthy to apply radium to a normal organ on an unfounded suspicion of cancer, as it is to perform a radical operation on similar grounds.

It must be admitted therefore that radium should be entrusted only to those who have a competent surgical knowledge of the organs which they are to treat. This does not necessarily exclude the general radiologist but it does impose upon him the duty of making a very complete clinical preparation for his work.

Having called attention to the possibilities of harm from the indiscriminate use of radium, we shall now direct our criticism to those who, like the reader, have employed radium as specialists.

Of the various gynecologic conditions which react dangerously to the influence of radium, that of pelvic inflammation is of supreme importance. Everyone who treats gynecologic cases is familiar with the serious damage that may be done in the presence of pelvic inflammation by such intrauterine instrumentation as curettage, the wearing of stem-pessaries, artificial insemination, insufflation of the tubes, etc. This same danger of lighting up an old inflammation exists and is greatly intensified after the insertion of radium tubes in the uterine cavity; for in addition to the injurious effect resulting from the presence of a foreign body in the uterus, there is added the devitalizing influence of the radium on the surrounding tissues and the consequent reduction of their resistance to infection. The application of radium, like the other forms of intrauterine manipulation does not stir up a reaction in every case of chronic pelvic inflammation, but it has the possibility always of doing so, and when such an event does take place the extent of destruction exceeds that of any infection ordinarily encountered in the pelvis from other causes.

The evil results from the effect of radium or pelvic inflammation are especially menacing because they are most apt to occur after applications to control nonmalignant uterine bleeding. This particular

use of radium at the present time is one of the most valuable of the gynecologist's resources. Myopathic conditions which formerly resisted medical or palliative measures and often required radical operation, are now successfully overcome by a single treatment of radium. The mere application of radium to a myopathic uterus requires little technical skill and can be performed by the veriest tyro. On account however of the danger of lighting up an old inflammatory process it does require an expert preliminary pelvic examination. The detection of latent or potential infections of the adnexa is often difficult for the most experienced gynecologist, and such a condition is not infrequently overloked even after the greatest care has been taken in making the diagnosis. It is a grave mistake therefore to assure the patient, as many do, that the use of radium inside the uterus is unattended with risk, for such is not the case.

In this same connection, a special danger lies in the fact that salpingitis, particularly in the subacute stage, is often associated with abnormal uterine bleeding, sometimes of an alarming nature. Such cases are apt to be subjected to radium treatment just as formerly they were to curettement. The destructive effect on the pelvic organs may be calamitous in the extreme, as we have had the misfortune to note both in our own experience and in that of others. In treating myopathies of the uterus therefore, with a suspicion of pelvic inflammation present, it is safer to refrain from radium and to resort to operative measures, for in such cases the dangers of radium greatly exceed those of surgery.

Other contraindications to the intrauterine use of radium have not all been told, and will be sooner or later learned by experience. It will suffice to mention several of these that have appeared in the practice of the writer.

Radium should not be given if there exists a retention follicular cyst of the ovary. Cysts of this kind may pass through periods of enlargement and recession. During the latter stage they may readily be overlooked by the examiner. The effect of radium on these cysts is to cause an immediate and painful enlargement which may become permanent. In the case treated by the writer, a subsequent removal of the pelvic organs became necessary.

The futility of the radium treatment of submucous polypoid myomas and pedunculated subserous myomas of the uterus has been frequently mentioned in the literature and needs no special comment, excepting that the writer's experience accords with that of others.

The inadvisability of treating sloughing fibroids with irradiation is obvious and yet we have heard of its being done.

One of the writer's personal mistakes was to treat with radium a patient with chocolate cysts. The patient, a woman of fifty, was given a full dose of radium, intrauterine, for severe menorrhagia, the diag-

nosis being that of uncomplicated fibroids. After about a year of amenorrhea, the menorrhagia returned with great severity, necessitating a radical operation. The fibroids were found reduced in size but the entire pelvis was filled with endometrial adhesions and implants including two large chocolate cysts of the ovaries. The natural difficulties of the operation were greatly intensified by the dense sclerosis resulting from the radium treatment. It is interesting to note that in this case the action of the radium did not have the destructive effect on the adnexa that is seen in cases of adhesions, resulting from true infection.

A most important contraindication to the use of radium is in the treatment of carcinoma of the body of the uterus. Radium is at present little used for this purpose, nevertheless there are some who are thus employing it and the writer is himself one who has made the error of trying it out. The reason usually given for not radiating cancer of the uterine body is that the operative results are so good that it seems inadvisable to trust to any other treatment. We are now in a position to give positive reasons against its use in this disease. We have shown in a very small series of cases and the smallness of the series makes it more convincing that an early cancer of the fundus that is entirely curable by operation is liable to reoccur when treated by radium alone.

The uncertain curability of the disease at its primary focus by radium is alone sufficient to condemn its use, but there is still another reason which should convince the most enthusiastic of radiologists. It has long been a matter of observation that cancer of the body of the uterus metastasizes first in the ovaries. The mode of transmission of the disease from the endometrium to the inner tissues of the ovary was a scientific mystery until the epochal work of Sampson taught us the frequency with which endometrial elements may become transplanted in the ovarian substance. That the intrauterine application of radium will not destroy endometrial elements in the ovaries is attested by two of our cases, one where the patient died of probable ovarian cancer after radium treatment for cancer of the fundus; and one where active chocolate cysts were removed a year after a radium treatment for nonmalignant bleeding. We must conclude from the foregoing that the treatment of cancer of the fundus of the uterus should be treated by a radical operation that includes both ovaries.

It should also be added that inasmuch as cancer of the body is a frequent associate of myomata, the ovaries should never be left *in situ* after the removal of a fibroid uterus without a careful inspection of the uterine canal of the removed specimen.

In the treatment of uterine myomata there is little disagreement among operators. Our own conclusions tally in general with those of

Clark, Keane, Heaney, and others. In the case of smaller nonpedunculated fibroids in patients with menorrhagia, near the menopause, radium has a most useful field, provided there are no pelvic complications. The final results however are not as definite as in myopathic cases with simple uterine insufficiency. In the treatment of larger fibroids we employ radium with extreme conservatism, and then chiefly as a palliative when there is grave secondary anemia or some dangerous constitutional affection. It should be remembered that in the majority of the larger fibroid tumors there is some associated complication. Of these the most common in the order named, are peritoneal adhesions with greater or less inflammatory reaction, adenocarcinoma of the endometrium, and sarcomatous degeneration, all conditions which definitely contraindicate the use of radium.

The operation of supravaginal hysterectomy has become so well standardized, and can be so rapidly and bloodlessly done that it must be regarded in most cases as the procedure of choice in the larger fibroids attended as it is with less danger than radium to the life and health of the patient. The borderline of choice between radium and operation must be decided by the experience of the surgeon who should take into account not alone the size of the tumor but its location, its behavior, and the possibility of complications. During the active childbearing period radium should be used to treat fibroids with the greatest reluctance. In order to effect a permanent diminution of a uterine fibroid it is necessary to give a sufficient dose of radium to destroy the menstrual and reproductive function of the organs for if the catamenia does return, even after a considerable period of amenorrhea, the tumor will also recur to its former size and activity.

We take this occasion to emphasize the value of myomectomy during the childbearing period. It is encouraging to see that this operation, at one time somewhat in ill repute, is being revived in many clinics. It is surprising what hopeless-looking tumors may be removed with complete restoration of the uterus to its normal contour and function. The operation requires ingenuity and practice but when mastered it is one of the most interesting as well as satisfactory procedures in gynecologic surgery.

One of the newer problems that confront the gynecologist is the production of amenorrhea or sterility for other reasons than those of local uterine disease. Of these the most important are the intractable dysmenorrheas and the intolerable headaches or other nervous manifestations that are dependent for their existence on the menstrual rhythm. In selected cases of this kind radium has proved of much value.

With the spread of lay knowledge of radium and its effects, pa-

tients of other types are applying for treatment, namely those who desire sterility on the grounds of expediency. The problem of treating these patients is an ethical one. In the case of married women who wish sterilization the procedure, in our opinion, should be the same as that in the matter of inducing abortions. There should be two other consultants and the decision should be made on the basis of the patient's physical health and not on that of her personal wishes or domestic exigencies.

When sterilization is desired for immoral purposes, treatment is obviously unethical and borders on criminal practice.

Perhaps the most important field of work in gynecology today is the treatment of cancer of the uterine cervix. Before the advent of radium the extended Wertheim operation had reached the limit of its possibilities and progress depended solely on the improvement in skill of the individual operator. Radium has given us new hope in treating this dreadful and rapidly increasing disease. In its use as a palliative, there is almost no case so far advanced in which the distressing discharges and often the pain may not be alleviated by irradiation.

In less advanced but still incurable cases the disease may with few exceptions be checked by a single treatment, so that the patient may live from one to three or even four years in perfect health. Reoccurrence when it does take place is apt to be internal and unassociated with the offensive discharges and fistulae that were formerly universal in the final stages.

It is in the so-called operable case that the question of the indication or contraindication of radium arises. Though not a few surgeons have discarded operation altogether in favor of radium, we have not yet personally come to a final conclusion. At first convinced that it was the duty of the surgeon to operate on every operable case instead of taking the more comfortable path of irradiation we have nevertheless made certain concessions to the radiologists. We have for example greatly modified our classification of cases. We have changed the term "operability" to "curability by operation," which has quite a different significance. Whereas we formerly over a period of many years operated on about 60 per cent of all cases, we now subject to operation only about 20 per cent. During the last five or six years we have carried on parallel series of operated and radiated cases, in which the disease is limited to the cervix and frankly curable by either operation or radium. Such patients have been chosen for irradiation as, on account of obesity or constitutional weaknesses, incurred a special risk in operation. Sufficient time has not elapsed to draw authoritative conclusions from this series, especially as the operated cases greatly exceed the others in number.

Nevertheless a recent comparison of the two types of cases of less

than five years' duration shows a similarity of results that, it must be confessed, has been somewhat surprising to the writer and encouragingly favorable to the use of radium.

198 COMMONWEALTH AVENUE. (*For discussion, see p. 562.*)

INTRACRANIAL HEMORRHAGE IN THE NEWBORN

BY WILLIAM SHARPE, M.D., AND A. S. MACLAIRE, M.D., NEW YORK CITY
(From the Department of Neurosurgery, N. Y. Polyclinic Hospital and Postgraduate Medical School)

RARELY has the condition of intracranial hemorrhage in the newborn been diagnosed in the acute stage within ten days after birth, unless the hemorrhage and the associated cerebral edema were of such large amount that either death occurred, or the baby exhibited signs of a severe cerebral lesion—stupor to the degree of unconsciousness, refusal to nurse and even repeated general convulsive seizures. Until recent years, the literature of intracranial hemorrhage in the newborn has been concerned with these extreme cases, either as postmortem studies of extensive intracranial hemorrhage due to laceration of the large sinuses, falx, etc., or as clinical observations of the signs of a probable intracranial lesion of hemorrhage and the description of methods to increase the coagulability of the blood and in this manner lessen the cerebral damage and its resulting chronic condition of cerebral spastic paralysis with mental retardation.

Almost one hundred years ago, Denis,[1] Billard[2] and Cruveilhier[3] in the period of 1826 to 1835 published several papers intimating and suggesting the causal relationship of intracranial hemorrhage at birth and the later development of cerebral spastic paralysis. In 1843, Mr. Little, of London, stated in his first monograph upon the subject of "Deformities of the Human Frame,"[4] that a difficult labor might be an etiologic factor but that lack of development of cerebral tissues and meningitic inflammatory processes were the usual causes; only nineteen years later (1862), in his second monograph upon this subject,[5] Mr. Little stated that as a result of further study and especially of a large series of postmortem examinations, he was of the opinion that almost 75 per cent of the cases of cerebral spastic paralysis were due to an intracranial hemorrhage at the time of birth. In 1885, Sarah McNutt[6] confirmed this opinion by careful pathologic studies. More recently, Beneke[7] in 1910, Pott[8] in 1911, Mayer[9] in 1915, Holland[10] in 1920, and within the past four years Schäfer,[11] Schwartz,[12] Saenger[13] and Capon[14] and others have contributed valu-

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Ohio, September 18 to 20, 1924.

able postmortem observations and yet the literature of the clinical observations has been most meager. In this country, Green,[15] Brady,[16] Sidbury,[17] Warwick,[18] Rodda,[19] and Huenekens[20] have all added to the knowledge of the subject during the past decade, and the present paper is a similar effort to facilitate the diagnosis and thus make possible the *early* rational treatment of the acute condition.

A number of years ago, in 1913, one of us (S.) became interested in the chronic condition of cerebral spastic paralysis in its various forms with and without marked mental impairment, and it was very impressive at that time[21] and during the past eleven years to note repeatedly in the histories of a large percentage of these patients—the ones having an increased intracranial pressure as disclosed by the ophthalmoscope and more accurately by the spinal mercurial manometer—that they were chiefly firstborn, fullterm males, the majority of them having had a difficult prolonged labor with and without the use of instruments, and that during the first week, and even two weeks after birth, they had been considered rather drowsy and stuporous with a lack of the normal demand for food, and even refusal to nurse, and in many of them the history of twitchings of the orbital muscles and of the hands and legs or even generalized stiffenings to the degree of convulsive seizures. After a period varying from several days to two or three weeks, the baby rapidly improved and was considered a normal child at the end of one month after birth and continued to be so apparently, until several months later—usually about the seventh or eighth month—when it was observed that the child was not holding up its head nor attempting to sit up, and frequently at this time a spasticity appeared in the arm and leg of one or both sides; later, when the child did not walk or talk, or if at all, until months after the usual time, this chronic condition developing in an apparently normal child, was most puzzling, and frequently the diagnosis of Little's disease implied a tainted heredity and lues as the etiologic factors in the lack of development. That the condition might be the result of an intracranial hemorrhage at the time of birth was very improbable as it was believed and taught that intracranial hemorrhage was of such an extensive character and of such great danger to the life of the newborn that the baby usually did not survive; the earlier study, therefore, of the acute condition of intracranial hemorrhage in the newborn was limited chiefly to postmortem examinations and therefore to the study of the extreme condition sufficient to cause death at the time of birth or within several days after birth.

During the past eleven years, we have had the opportunity to examine both at operation and at autopsy, the brains of a large series of the chronic cases of cerebral spastic paralysis having a definite increase of the intracranial pressure and the pathology has been practically the same—"wet" edematous brains under varying degrees of in-

creased pressure and along the supracortical veins in the sulci has been demonstrated the cloudy, whitish, new-tissue formation with a fibrous thickening of the walls of these veins—the organization-residue of a former layer of supracortical hemorrhage which had occurred most probably at the time of birth and of larger amount than could be entirely absorbed by the natural means of excretion. Since it has now been demonstrated that over 80 per cent of the cerebrospinal fluid is normally excreted through the walls of the supracortical veins, the partial blockage of this main channel of excretion of the cerebrospinal fluid by the organization-residue of a former hemorrhage in these patients explains the "wet" edematous condition of the brain under varying degrees of increased pressure and the resulting spastic paralysis in its various forms associated with a mental retardation of varying degree. The treatment of these chronic conditions in the older patients can, at best, be directed only toward an improvement—lowering the increased intracranial pressure, the use of orthopedic measures and mental training.

During this same period of eleven years, we have had the opportunity of examining in consultation and treating 59 newborn babies within the first ten days after birth. The signs of an acute severe intracranial lesion were very evident—stupor and coma, refusal to nurse and muscular twitchings to the degree of convulsive seizures. Lumbar puncture in these early cases revealed bloody cerebrospinal fluid under varying degrees of increased pressure and repeated lumbar punctures of spinal drainage in the milder cases or the modified subtemporal decompression of cranial drainage in the more severe cases made possible a recovery of life in a small percentage of them. One of the patients in this series (in 1920), on the third day after a difficult instrumental birth, appeared to be a normal baby with the exception of spasmodic twitchings of the left orbital muscles two or three times each hour; careful neurologic examination was negative but a lumbar puncture was advised merely to confirm these negative findings, so that the parents could be assured that no intracranial complication had occurred. Two hours later and *before* the lumbar puncture was performed, the baby suddenly died and at autopsy there was disclosed a supracortical hemorrhage of over one inch in thickness upon both cerebral hemispheres—the longitudinal sinus having been torn at the posterior margin of the anterior fontanelle. This case, and the mildness and even apparent lack of the definite signs of severe intracranial hemorrhage in the other acute cases as disclosed at both operation and at autopsy, led to the belief that possibly an intracranial hemorrhage of mild degree at the time of birth did not produce marked clinical signs of its presence owing to the less highly developed cortical cells at this early age and that possibly the

complication of an intracranial hemorrhage at the time of birth was of more common occurrence than ordinarily suspected.

First Series.—To determine the frequency of this complication in the newborn, permission was obtained in January, 1923, from F. A. Dorman and Wilbur Ward to perform a routine lumbar puncture upon a series of consecutive newborn babies at the City Hospital, Welfare Island. In the first series[22] of 100 consecutive newborn babies, the cerebrospinal fluid was bloody in 4 and blood-tinged in 5—that is, a total of 9 (9 per cent), and under varying degrees of increased pressure (the normal pressure in the newborn, two weeks after birth, being approximately 3 to 5 mm. as registered by the spinal mercurial manometer). As many as 6 lumbar punctures of spinal drainage were necessary in one case to obtain clear cerebrospinal fluid and under normal pressure. Two of these babies died and autopsy revealed a large ventricular hemorrhage in one and a mild subarachnoid hemorrhage with extensive cerebral edema in the other. The postmortem finding of free blood along the supracortical veins in the sulci confirms the observations made at autopsy and at operation upon other acute cases in the newborn and supports the belief that if this free blood cannot be entirely absorbed, then an organization-residue occurs *in situ* with the resulting partial blockage of the excretion of the cerebrospinal fluid—the usual pathology in the cases of cerebral spastic paralysis having an increased intracranial pressure and due to an intracranial hemorrhage at the time of birth. Repeated lumbar punctures of spinal drainage at intervals of twelve hours were sufficient to make the cerebrospinal fluid clear and under normal pressure in the remaining 7 cases. No instruments had been used in these 9 cases; one was a version with breech extraction; in two, the cord was about the neck. Low forceps had been applied in 10 cases of this series, but no intracranial hemorrhage had occurred in these particular instrumental deliveries. The cord-Wassermann was negative in each case. Two cases were reported as "jaundiced." One baby in whom convulsive twitchings developed ten hours after birth had clear cerebrospinal fluid and the muscular twitchings ceased within six hours after the lumbar puncture—being the result possibly of the cortical irritability of a mild cerebral edema. (Dry tap in 7 cases.)

Impressions.—Acute intracranial hemorrhage and cerebral edema of varying amounts in the newborn occur rather frequently. The simple method of lumbar puncture within the first week after birth may be used to demonstrate the presence or not, of free blood in the cerebrospinal fluid; if present, then the natural means of its absorption can be aided by the repeated lumbar punctures of spinal drainage; and, if not present, then an intracranial hemorrhagic lesion may be practically excluded. The mildness and almost lack of marked clinical signs, even in the presence of extensive intracranial hem-

orrhage and cerebral edema in the newborn, emphasize the advisability and importance of an early lumbar puncture, both as a diagnostic and as a therapeutic measure, in any suspected case of an intracranial lesion in the newborn, irrespective of the type of labor. This early recognition of an intracranial hemorrhage in the newborn and the appropriate treatment will thus tend to lessen that large chronic group of physically impaired and mentally retarded children.

Second Series.—In the second series[23] of 100 consecutive newborn upon whom a lumbar puncture was performed within twelve to twenty-four hours after birth, bloody cerebrospinal fluid of varying degree was found in 13—that is, in 13 per cent; 9 were bloody, 3 blood-tinged and 1 was yellow, containing many red blood cells. There was no mortality in this series and the intracranial pressure in the bloody cases ranged from 4 to 26 mm.; 5 punctures of spinal drainage were the largest number necessary to obtain clear cerebrospinal fluid under normal pressure. The anterior fontanelle did not appear to be an accurate index of the intracranial pressure. Two of the babies exhibited muscular twitchings of the face, hands and feet and also cyanosis of the face which disappeared within six hours after the lumbar puncture; marked signs as stupor, refusal to nurse or convulsions were not present in any of the cases. The labor in these 13 bloody cases was normal cephalic in 6, prolonged in 3, 2 of which terminated as cephalic presentations and 1 as a breech; median forceps were used in 2; 1 was a face presentation and 1 the child of an eclamptic mother. Jaundice was present in one case only. The coagulation time of the blood was normal in all 13 bloody cases; one case clinically diagnosed as hemorrhagic disease of the newborn did not have an intracranial hemorrhage and the 13 cases with bloody cerebrospinal fluid did not have a lengthened coagulation time. Ten babies were of luetic mothers and in only 2 of them was the cerebrospinal fluid bloody. (Dry tap in 6 cases.)

Impressions.—Intracranial hemorrhage in the newborn occurs more frequently than formerly suspected—the acute cases with mild signs or no recognized signs at all being overlooked. Hemorrhagic disease of the newborn does not appear to be an important etiological factor. Instrumental delivery becomes a causative factor when the application is a late difficult one—where it is a medium or especially a high rather than a low forceps applied early. Early lumbar puncture is advocated as a safe routine procedure in suspected cases having the milder signs of intracranial hemorrhage and cerebral edema.

Third Series.—In the third series[24] of 100 consecutive newborn babies upon whom a lumbar puncture was performed within 12 to 24 hours after birth, bloody cerebrospinal fluid of varying degree was found in 10—that is, 10%; the fluid was red with blood in 4 and

straw-colored and yellow with many red blood cells in 6. Six was the highest number of lumbar punctures necessary to obtain clear cerebrospinal fluid under normal pressure. There were no deaths in this series. Seven babies born of luetic mothers all had clear cerebrospinal fluid. Forceps were applied in 9 cases in this series; of the two medium applications, in one the cerebrospinal fluid was blood-tinged and in the other bloody, and in the 7 low applications, only 1 baby had free blood in the cerebrospinal fluid. The one case of version with breech extraction had clear cerebrospinal fluid. The intracranial pressure ranged from 3 to 15 mm. and again the anterior fontenelle was not a reliable indicator of the intracranial pressure. The blood-coagulation time was not lengthened in any of the four bloody cerebrospinal fluids and in only one of the yellow fluids was it slightly prolonged to ten minutes (normal clotting time being considered as five to eight minutes). However, in 4 cases having clear cerebrospinal fluid, the blood-clotting time was eight and one-half to eleven minutes, so that it seemed that the hemorrhagic tendency in the newborn is only of minor importance as an etiologic factor in the production of the intracranial hemorrhage. Four babies, in whom the cerebrospinal fluid was clear within twenty-seven hours after birth became jaundiced on the second, third, sixth and seventh day respectively; in 2 of these babies, the blood-coagulation time was 4 minutes, and in the other 2, 10 and 11 minutes respectively. (Dry tap in 6 cases.)

Impressions.—Early lumbar puncture should be employed in cases of suspected intracranial hemorrhage in the newborn, in the absence of shock, not only for its diagnostic but for its therapeutic value. Repeated lumbar punctures of spinal drainage every 12 to 24 hours are indicated according to the increased intracranial pressure of hemorrhage and cerebral edema. Yellow spinal fluid in the newborn is most probably the result of transudation of the blood-plasma when red blood corpuscles are absent, hemoglobin not being demonstrated by the guaiac test, and due to minute hemorrhages when red blood corpuscles are present.

Fourth Series.—In the fourth series of 100 newborn babies upon whom a lumbar puncture was performed within 24 to 48 hours after birth, the cerebrospinal fluid was bloody in four and straw-colored in three—a total of seven (7 per cent). (Chart I.) One baby having bloody cerebrospinal fluid died and the autopsy revealed extensive intraventricular, basal and supracortical hemorrhages (Figs. 1, 2, 3). This baby was apparently normal at birth, but lumbar puncture, four hours after birth revealed bloody fluid under 10 mm. pressure; the blood coagulation time was 6 minutes; 14 hours after birth, general convulsive seizures occurred with respiratory difficulty and death. Jaundice was present in four babies, in three of whom the spinal fluid

Chart I

Hemorrhagic Cases

NO.	NAME	PARA	LABOR OR POSITION	ANTERIOR FONTANELLE	CHARACTER OF SPINAL FLUID	PRESS.	BLOOD CLOT TIME	NO. OF PUNCTURES TO CLEAR FLUID	MISCELLANEOUS
1	M. S. white	i	L. O. A.	Flush	Yellow (clear)	6 mm.	Hg. 3½m.	4	
2	E. P. colored	ii	L. O. A.	Flush	Bloody	10 mm.	6m.		Died at 14 hrs. of age. Autopsy—ventricular, basal and supracortical hemorrhages
3	M. Z. colored	i	Prolonged	Flush	Blood Tinged	10 mm.	5m.	5	Convulsion on 4th day. Recovery
4	W. F. white	iii	Low Forceps	Flush	Bloody	10 mm.	7m.	4	4+ Blood Wass.
5	E. P. colored	i	L. O. A.	Depressed	Bloody	9 mm.	5½m.	4	
6	R. F. white	iii	L. O. A.	Depressed	Yellow (clear)	16 mm.	7½m.	3	Cord around neck
7	E. H. colored	ii	R. O. A.	Depressed	Yellow (R.B.C.)	12 mm.	3½m.	3	Nursed poorly

Chart II

Cases with Signs with Clear Fluid

NO.	NAME	PARA	LABOR OR POSITION	ANTERIOR FONTANELLE	CHARACTER OF SPINAL FLUID	PRESS.	BLOOD CLOT TIME	SIGNS
1	S. K.*	ii	R. O. A.	Flush	Clear	8mm. Hg.	7 m.	Cyanosis
2	G. S. colored	ii	R. O. A.	Flush	Clear	6 mm.	4 m.	Twitches of arms and legs
3	S. L. colored	i	Prolonged	Bulging	Clear	12 mm.	3 m.	Twitches of arms and legs
4	R. A. white	i	Dry Labor	Bulging	Clear	12 mm.	3½ m.	Convulsions

*Color not recorded.

was clear and in one a golden yellow and slightly turbid with numerous red blood cells; in this baby, the jaundice appeared on the seventh day, and it is interesting that the fluid from the first lumbar puncture, performed fourteen and a half hours after birth, was clear, under 6 mm. of pressure and the blood-clotting time was 7 minutes; whereas when jaundiced, the cerebrospinal fluid was yellow with red blood cells, under 8 mm. of pressure and the blood-clotting time was only 4 minutes.

As in the preceding three series of the newborn, neither sex predominated and approximately 50 per cent were firstborn babes. The signs observed in this series of newborn were the following: muscular twitches of the extremities and face and convulsive seizures in five, in two of whom the cerebrospinal fluid was bloody, but in the other three, clear. Poor nursing in one and in this particular baby,

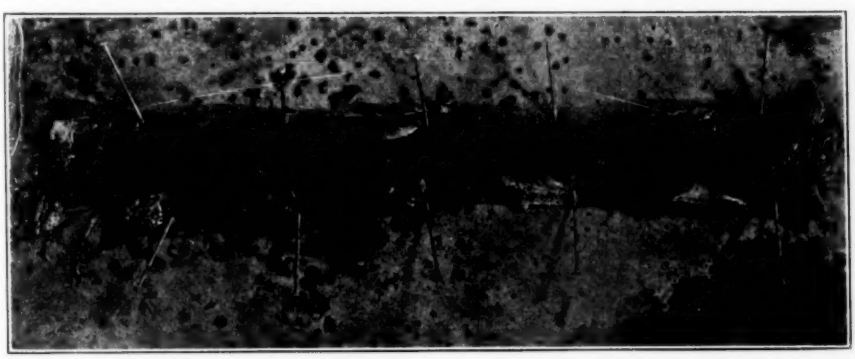


Fig. 1.—Case 2, E.P. Large subarachnoid hemorrhage throughout the spinal canal, surrounding the cord and medulla.

the fluid was yellow with many red blood cells. Cyanosis was present in one baby having clear fluid. Normal intraspinal pressure (5-8 mm. of mercury within 48 hours after birth) was present in 45 cases, one of them having yellow fluid; above normal in 32, six of them having bloody or yellow fluid, and below normal in 8, and in these the fluid was clear. Seven premature babies were not punctured. Venous contamination of puncture occurred in two cases and in 5 babies the spinal canal could not be tapped, presumably due either to faulty technic or to anatomic variation. In one case, the pressure was not recorded.

The blood-clotting time was normal (3-8 minutes) in 81, 7 of them having hemorrhagic cerebrospinal fluid; prolonged in 2 (8½ and 10 minutes respectively); below normal in 1 and not recorded in 16; (these included the babies not punctured or successfully tapped and the premature babies). The anterior fontanelle was flush in 38 and of them 4 had hemorrhagic fluid; depressed in 39 of whom 3 had

hemorrhagic fluid; bulging in 14 and in them all the fluid was clear. The status of the fontanelle was not recorded in 9.

In five mothers the Wassermann test was 4 plus, and in four babies the Wassermann was 4 plus in 3 and 2 plus in 1; only one luetic child had bloody fluid. Seven of the 9 premature babies were not punctured on account of their low vitality; 3 of these babies died and autopsy did not reveal an intracranial hemorrhage.

Fig. 2.—Same case as Fig. 1, showing extensive subcortical and subarachnoid hemorrhage in brain. Note the free blood in the sulci. Right lateral view.

Fig. 2-*A*.—Left lateral view of brain shown in Fig. 1.

Type of Labor.—The position was L.O.A. in 49, of whom 4 had hemorrhagic fluid; in 23 it was R.O.A., of whom 1 had yellow fluid and R.O.P. in 1 with clear fluid. (Chart III.) Low forceps were used in 10, of whom 1 had bloody fluid; prolonged labor in 2, one having blood-tinged cerebrospinal fluid. One dry labor, one cesarean section, 1 frank breech and 1 induced labor, all had clear fluids. In one case having convulsive seizures due to a mild cerebral edema with no hemorrhage present, 4 lumbar punctures of spinal drainage were

necessary before the increased intracranial pressure was lowered and the convulsions then ceased.

Impressions.—The signs of intracranial hemorrhage in the newborn are meager and even absent, unless the hemorrhage is of large amount. At present, early lumbar puncture is the only accurate means of diagnosis and especially in the mild and so-called signless cases. The therapeutic lumbar punctures of spinal drainage should be repeated as frequently as the severity of the intracranial hemorrhage warrants —every twelve to twenty-four hours, and even more frequently.

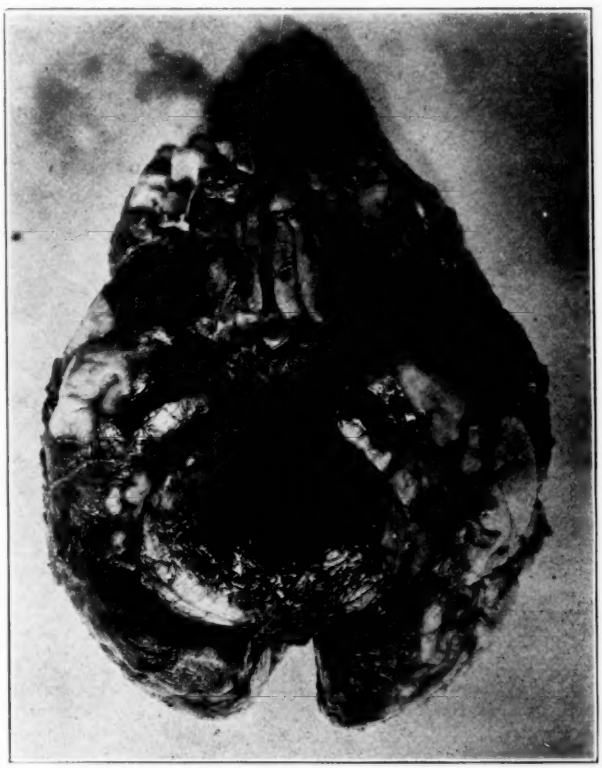


Fig. 3.—Also from Case 2, showing profuse basilar hemorrhage. Note the massive hemorrhage around the medulla.

Babies of low vitality, and especially if premature, or babies in a state of shock should not be punctured even in the presence of signs of an intracranial hemorrhage, until the general condition improves. (This is true of brain injuries in adults as in the newborn—the treatment should be directed to the general condition of shock rather than to the local intracranial condition; if the patient is unable to survive the shock, no examination or tests will aid, but rather increase the shock.) Muscular twitches of fingers, extremities, face and orbits are very suggestive as signs of increased cerebral irritability and due to supracortical hemorrhage or cerebral edema. The use of early and correctly

CHART III

TYPES OF LABOR OR POSITIONS

L. O. A.	49	of these 4 were abnormal fluids {2 yellow—clear, 2 bloody}
R. O. A.	23	of these 1 was abnormal fluid (yellow—R. B. C.)
R. O. P.	1	
Low Forceps	10	of these 1 was abnormal fluid (bloody)
Dry Labor	1	
Prolonged	2	of these 1 was abnormal fluid (blood tinged)
Cesarean Section	1	
Frank Breech	1	
Prematures	9	
Not mentioned	1	
Normal	1	
Induced Labor	1	

applied forceps, especially low forceps, does not increase the danger of intracranial hemorhage, but prolonged labor causing extreme intracranial venous stasis and especially when instruments are used as a last resort and particularly delayed medium forceps, then the danger of intracranial hemorrhage is greatly increased. Hemorrhagic disease of the newborn does not appear to be an important etiologic factor. Early lumbar puncture as a diagnostic and therapeutic aid is not advocated as a routine procedure, but only in doubtful and suspected cases of intracranial hemorrhage; thus its early recognition at the ideal time for treatment should permit the greatest possible recovery, both of life and of future normality.

REFERENCES

(1) *Denis:* Commercy, 1826. (2) *Billard:* Paris, 1828. (3) *Cruveilhier:* Paris, 1829-35. (4) *Little, J. W.:* Deformities of The Human Frame, London, 1843. (5) *Little, J. W.:* On the Influence of Abnormal Parturition, Difficult Labors, etc., upon the Mental and Physical Condition of the Child, Obst. Tr., 1862, iii, 243. (6) *McNutt, Sarah:* 1885. (7) *Beneke:* München. med. Wchnschr., 1910, p. 2125. (8) *Pott:* Zeitschr. f. Geburtsh. u. Gynakol., 69, 1911. (9) *Mayer, A.:* Zentralbl. f. Gynakol., 1915, No. 46. (10) *Holland:* Trans. Edinburgh Obst. Soc., 40, Edin. (11) *Schafer:* Ztschr. f. Geburtsh. u. Gynäk., 1921, lxxxiv. (12) *Schwartz:* München. med. Wchnschr., 1922, No. 30. (13) *Saenger:* Monatsschr. f. Geburtsh. u. Gynäkol., 1924. (14) *Capon:* Jour. Obst. and Gynec., Brit. Emp., 1922, xxix, 572. (15) *Green:* Boston Med. and Surg. Jour., 1914, clxx, 682. (16) *Brady:* Jour. Am. Med. Assn., 1918, lxxi, 347. (17) *Sidbury:* Arch. Ped., 1920, xxxvii, 545. (18) *Warwick, Marg.:* Am. Jour. Med. Sci., 1919, clviii, 95. (19) *Rodda, F. C.:* Am. Jour. Dis. Child., 1920, xix, 268. (20) *Huenekens, E. J.:* Jour. Am. Med. Assn., lxxxi, 624. (21) *Sharpe, W.:* (a) Jour. Am. Med. Assn., May 13, 1916, lxvi, 1536. (b) Proc. Am. Assn. for Feeble Minded, 1918. (22) *Sharpe, W.:* Intracranial Hemorrhage in the Newborn, Jour. Am. Med. Assn., Aug. 23, 1923, lxxxi, No. 8. (23) *Sharpe and Maclaire:* Surg., Gynec. and Obst., Feb., 1924, pp. 200-206. (24) *Sharpe and Maclaire:* AMER. JOUR. OBST. AND GYNEC., August, 1924.

20 WEST FIFTIETH STREET.

124 EAST EIGHTY-FIRST STREET.

(*For discussion, see p.* 548.)

APPENDICITIS IN CHILDREN, WITH REPORT OF CASES*

By G. Van Amber Brown, M.D., Detroit, Mich.

CONCERNING appendicitis in children there are yet many problems to be settled. Of all acute emergencies in abdominal diseases in children, the vermiform appendix is the most frequent cause. An acute attack of appendicitis attended by gangrene or perforation is the most common catastrophe, placing the life of the child in sudden peril. The mortality rate is alarmingly high, and the statistics in this country as well as in England and Wales show that the death rate from this disease tends to increase rather than diminish. The terrible fatality of this disease is due almost entirely to late diagnosis, and to measures so frequently administered for the relief of early manifestations. The need for its certain and speedy relief is the immediate intervention of the surgeon.

ANATOMY

The subject of appendicitis in children is approached to greater advantage if one bears in mind that the abdominal anatomy of the child differs from that of the adult. Of course, the older the child the nearer the approach to adult life. It is to be remembered that children have a small abdominal cavity, accompanied by a small undeveloped pelvis. Crowded into the abdomen is a relatively large liver and a proportionately long intestinal tube. Owing to the small size of the pelvis, there is little of the intestine found in it. The sigmoid flexure is long and may be found in almost any part of the abdomen. Normally, the cecum lies under the liver until the fourth month after birth (Treves), but on account of improper fetal development, may rest until the third or fourth year, and even later, close beneath the right costal margin. In the very young child, the stomach still occupies a somewhat more vertical position than is present in the adult, and the connection between the colon and the greater curvature of the stomach does not exist, because the folds of the peritoneum which invest the stomach and unite with each other at the greater curvature to form the great omentum, have not become adherent to the peritoneum which envelops the colon.

The omentum is a constant factor for careful consideration in laparotomies undertaken for any purpose. Modern surgery has done much to demonstrate its physiologic importance. With its enormous network of blood vessels, it may be looked upon as a regulator for the

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons held at Cleveland, Ohio, September, 18, 19, 20, 1924.

equalization of the abdominal blood streams, while from another standpoint it may be considered as a great lymph gland whose function is probably that of equalizing the lymph circulation of the abdominal currents.

The normal mechanical uses of the omentum are obvious: Retention and equalization of heat, the protection of the intestines from injury, the diminution of friction and the support of the intestines in their peristaltic functions.

The omentum, likewise, has a heavy deposit of periglandular fatty tissue which, under favorable circumstances, by an increased activity of its cells, is replaced by lymphoid tissue, and from this standpoint may itself be indirectly considered as an adjunct to the lymphatic system. The vessels of the omentum have distributed to them nerves having their origin in the celiac plexus. It is a safe conclusion drawn from the anatomic construction of the omentum, that it exercises an important rôle in the economy for maintaining in stable equilibrium the fluids of the abdominal cavity, and if we consider it as a great ganglionic system, we may better understand its importance and value as a surgical factor. And has it not also a phagocytic power? It will come down and bury a foreign body or an infected area, at the same time throwing out its lymph exudate. Again, we find it doing the reverse to this, absorbing free sterile fluids. Whatever value it may possess though, in the child is lost, since it may be entirely absent and at the best is small and not at all substantial. Added to these abdominal differences between the adult and child, are two other factors: First the more poorly developed cardiac sphincter in the child, second, until the fourth year and occasionally the eighth, the glomeruli of the kidneys are not numerically developed.

STRUCTURE OF APPENDIX

The appendix of the infant is situated much higher in the abdomen than in the adult. It is relatively larger, and the mesoappendix, from which it receives its nourishment, is much thinner than in the adult, translucent, and frequently shortened, extending only about half way to the distal end of the appendix in fifty per cent of cases. The lumen is large and the cecum small. Normally the appendicular orifice is much better developed in youth than in old age.

In the fullterm fetus, there is practically no lymphoid tissue. The lymphoid follicles, too, are absent. During the first two weeks there appear two or three well-marked lymph follicles and lymph tissue is scattered profusely throughout the whole mucosa. In a month more, the number of lymph follicles increase to from eight to twelve, and the lymphoid tissue is seen infiltrating the mucosa and submucosa. At thirty-two weeks, the appendix is to all appearances an actively

functionating gland. Owing to the fact that appendicitis is preeminently a disease of early life, and also that affections of adenoid tissue are more likely to occur in the young than in the old, we are led to believe that these are of etiologic importance.

PHYSIOLOGY

Of the function of the appendix, we know almost nothing, but that it is of some real significance is probable from the fact that the vascular supply of this little tube is considerable and apparently out of all proportion to its size or manifest importance. The appendix communicates by a valvular opening with the interior of the cecum. With the anatomic arrangement as it is in this area, it seems reasonable to suppose that the glairy mucoid secretion of the appendix possesses some small digestive power. This funcion, however, is not to be condemned as trivial and without value because ablation of the appendix involves no digestive losses. Speaking in this connection, Moynihan says, "I can recall more than one case of permanent biliary fistula in the old days when every drop of bile was discharged on to the abdominal wall and was lost to the economy. In spite of this, there was no apparent diminution in bodily health or weight or capacity; yet no one was disposed to deny the value of this copious secretion. Because we do not know the use of the appendix and are unable to measure its function, we are not rashly to condemn it as devoid of worth."

ETIOLOGY

Our present conception of appendicitis, a disease which may occur at any age, is that it begins as an infection of the mucosa and probably, in most cases, is hematogenous. However, there may be exceptions as shown by Rhendorf. He has found the ascaris in the appendix at the time of operation. He contends that the worm produces toxic substances which injure the mucosa, and is a determinative factor in the inflammation.

DIAGNOSIS

No greater responsibility presents itself to the physician than the decision in the case of an obscure abdominal condition. Although appendicitis is easy to diagnose early when it appears in textbook form, in the atypical manifestations it is likely to tax to the utmost the diagnostic acumen of the physician. The younger the child the more difficult the diagnosis of appendicitis, but fortunately also, the condition is less likely to be appendicitis. In Abt's series of 80 cases under two years of age, the extreme mortality makes an early recognition of the disease imperative. In most of his cases, the diagnosis was not made until the inflammation had extended beyond the appendix, and in a number it was made at autopsy. Helmholtz reports

a series of 15 cases in children under five years, emphasizing the same points. In his series, the mortality was 47 per cent.

The younger the child, the less probable naturally, is the history of previous attacks. Under twelve years, 30 per cent of cases will give a history of previous attacks, while up to five years of age only 6 per cent show such a history. The diagnosis of appendicitis in the very young children is rendered difficult by the similarity of the symptoms to those which result from the more common and simple gastrointestinal troubles of childhood. If the attack is early and relatively slight, the vague symptoms, in the majority of cases, pass off in a few hours having attracted little attention. It is of course, not possible to make a diagnosis in these cases, but their recurrence without obvious exciting cause, should increase the suspicion with which the appendix may be regarded. If the condition is more severe, the symptoms are more pronounced and the diagnosis will be relatively easier.

As a rule, the symptoms in the ordinary acute attack of appendicitis in the child are more marked than in the adult. In acute appendicitis, the direct diagnosis rests on the sudden onset of abdominal pain, vomiting, fever, rigidity and local tenderness. The pain is the first symptom. It is always pain, and never sickness, or vomiting or malaise, or any other symptom whatever. If pain should not be the initial symptom in a case of acute abdominal illness, the possibility of the appendix being at fault may definitely be excluded. In making a diagnosis in these youthful patients, it is well to remember that in the child, there may be an exaggerated descent of the cecum and the appendix is fairly often located over the brim of the pelvis in close proximity to the bladder. In such cases the point of greatest tenderness will in all likelihood be in the left iliac fossa. In fact, a left-sided location of pain and other symptoms either in the epigastrium, under the costal arch, or in the loin is not unusual, since the abdominal position of the appendix is apt to be common among children. When the valuable sign of tenderness at McBurney's point is absent in an acute appendicitis, it is because the appendix is not normally placed. It must be borne in mind that the greatest point of tenderness is over the appendix. Also the observation is a frequent one, that the flexion of the thigh is due to irritation of the psoas muscle and may be suggestive of a deep-seated appendicitis.

In acute appendicitis in children, the percentage with localized or diffuse peritonitis is higher than in the adult. In the child the peritonitis is also much more virulent and more rapidly fatal, since in this stage, children during a given time become more profoundly toxic. It is also true that appendiceal abscess is more often seen in the child than in the adult, the most favorable sites for the collection of pus

being at the brim of the pelvis to the outer side of the cecum, within the pelvis, or high up to the outer side of the cecum beneath the liver. The first type can readily be diagnosed by palpation and percussion, the second by rectal examination, while the third is characterized by tenderness and pain in the loin. It is this last type that presents greatest difficulty in differentiating appendicitis and thoracic conditions. Urinary symptoms in a child should arouse suspicion of appendicitis before a definite diagnosis is pronounced. Pain on urination occurred in 8 per cent of Porter's cases. Rectal examination should never be omitted since, in a child the examining finger can reach high up in the pelvis. When the extension of the disease is beyond the appendiceal region, it has been shown that it usually takes place along the pelvic wall and the evidence of inflammation is easily felt. While the leucocyte and differential count are of prognostic value, they are of little value as a diagnostic aid. The clinical manifestations tell the story better than any of the laboratory tests.

DIFFERENTIAL DIAGNOSIS

It is to be emphasized that a differential diagnosis should be based on the history, the symptoms and signs, and a complete clinical examination of the entire patient. In this way only can we avoid operating for appendicitis on patients who do not have it. Conditions outside the abdomen that may simulate appendicitis are the prodromes of acute infectious diseases, such as scarlet fever, measles and typhoid fever. The onset of acute diseases of the respiratory tract, rheumatic fever, osteomyelitis and pyelitis may simulate appendicitis. Conditions within the abdominal cavity that are likely to come into consideration, are gastrointestinal colic, mesenteric lymphadenitis (Brenneman) and cysts of the mesentery. Intussusception of Meckel's diverticulum or diverticulitis may give a picture of appendicitis, but more frequently the case resembles intestinal obstruction. Frequently appendicitis is mistaken for some form of intestinal obstruction, but happily this is not a serious blunder, since both conditions are surgical, requiring immediate interference, and the trouble is usually found at operation.

In gastroenteritis, the fever is continuously high and there is frequent inclination to purging. There may be distention, pain and tenderness on palpation, but marked rigidity is never present. In children, pneumonia may simulate appendicitis especially when the thoracic signs are absent as they sometimes are for the first 24 to 36 hours. In pneumonia, the respirations are more rapid than in appendicitis, indeed much more rapid than is consistent with the pulse; and the distention if present, is usually uniform. There may be also, nasal breathing, the respiratory grunt, cyanosis and herpes sometimes. The leucocyte count is also higher than in appendicitis. X-ray examina-

tion will often clear up the diagnosis when a basal pneumonia or diaphragmatic pleurisy is present.

Infection of the urinary tract may simulate appendicitis. Not infrequently, a right-sided pyelitis, especially in infants, may simulate the beginning of appendicitis so exactly as to deceive the most expert diagnostician until urinalysis reveals the location of the trouble in the kidney instead of the appendix. A hydronephrosis may also provoke confusion.

Finney cites a case in which the day after the removal of a swollen, thickened appendix, the child developed measles. In a second case, similar pain in the right iliac fossa cleared up when measles broke out the next day. In a third case in which the patient was not operated upon because the symptoms were indefinite and the brother had measles, operation was delayed until after the appendix had ruptured.

In some way even pericarditis has been operated upon for appendicitis.

PROGNOSIS

The prognosis of acute appendicitis in childhood is good provided it is recognized and operated on early in the disease. If pus is not present, the diagnosis should be equally as good as in the adult. Including all types of cases, the mortality is around, probably above 10 per cent.

CASE REPORTS

I wish to report briefly the findings in a series of 700 cases of appendicitis operated upon during the past three years.* There were 597 cases over 12 years of age. Of these, 328 were males, 269 were females. Acute appendicitis occurred in 243 males and in 117 females. Chronic appendicitis occurred in 85 males and in 152 females.

It will be seen from these figures that acute appendicitis is over twice as common in males as in females, while chronic appendicitis is almost twice as common in females as it is in males. There were 73 cases where cathartics were given. Forty-six or 63 per cent, were ruptured. The total number ruptured were 111, or 19 per cent. These last figures emphasize the danger of giving cathartics in acute cases of appendicitis.

These records were reviewed especially with the idea of obtaining further data regarding appendicitis in children. Of these 700 cases, 103 were twelve years of age or younger. These histories serve to bear out claims set forth in this paper. Included in the 103 cases were 22 chronic appendices of which 8 were males and 14 females. Eighty-one were acute appendices of which 51 were male and 30 female. The statement that chronic appendicitis is more common in

*This material is gathered from the records of several Detroit hospitals and the practices of a number of surgeons and also includes my own experiences.

the female, while acute appendicitis is almost twice as common in the male, applies also in childhood. Of the acute cases, 10 or 12 per cent were suppurative with localized abscess. Fifty-four or 66.6 per cent were gangrenous. Duration of illness before operation varied from one to seven days. In all acute cases with longer duration than three days, there was free pus in the abdomen or localized abscess around the appendix. In this series, males predominated, there being 59 males and 44 females.

Pain was the initial symptom in 101 or 98 per cent of the cases. The remaining two cases were chronic and complained of nausea and vomiting. We can say therefore, that in 100 per cent of the acute cases, pain was the initial symptom. Nausea and vomiting occurred in 96 or 93 per cent of the cases. The remaining seven were chronic cases in which there was a history of frequent attacks of nausea but no vomiting. From this we may say also that in the acute attacks, this symptom was present in 100 per cent of cases. Vomiting was a prominent symptom and in most cases occurred just once and that with the onset of the pain. In some however, it continued up to the time of operation. Headache was a rare symptom occurring only 6 times, or 5.8 per cent, in this series. Tenderness and rigidity occurred in 82 cases or 80 per cent. Tenderness was always more marked in the right lower quadrant. Constipation was mentioned in 32 cases—diarrhea in 3 cases. In the majority of cases, there was no history of constipation and bowels had always been regular. Distention mentioned in 15 cases occurred chiefly in those of gangrenous appendices with longer duration than three days. Temperature varied from 100 to 104 degrees. Urine was negative except in two cases where there was a slight trace of albumin. The white blood count varied from 14,000 in a case of ruptured appendix with abscess to 35,000 in a case where there was no pus. The observation is worthy of note that the lowest leucocyte count was seen in a pus case, while the highest was in a case showing no pus. Polymorphonuclear leucocytes ranged from 62 per cent to 92 per cent.

Of the 103 cases, 37 were ruptured, 23 male and 14 female. Rupture occurred chiefly in gangrenous appendices. In 20 acute cases, where catharties were known to have been given, 15 or 75 per cent were ruptured. One on the point of rupturing had free pus in the abdomen. The remaining four were acutely congested. Fifty-two, or 64.6 per cent, of acute cases had pus in the abdomen. Of these 31 had free pus in the abdominal cavity, while 21 had localized abscess. There were 12, or 11.6 per cent, who died. These were all acute cases. Two died of pneumonia following operation. One died of intestinal obstruction. Eight had free pus in the abdominal cavity. One of these was complicated by intestinal obstruction and by general peritonitis.

One had a large localized abscess which during operation was accidentally ruptured and its contents spread through the abdominal cavity leading to general peritonitis.

TREATMENT

Appendicitis is a disease which derives its fiercest activities from the means which are taken to treat it. The acute spreading peritonitis is rarely if ever, the result of an untreated disease. It is the administration of aperients which transform a simple disease into one of the more serious type. Lower in his paper says, "The appropriate treatment of severe acute cases, which includes faithful application of the Ochsner treatment, plus the Alonzo Clarke treatment for peritonitis, plus large hot packs over the abdomen, plus hypodermoclysis, reduces the mortality rate to a minimum."

I believe firmly that the serious character and terrible fatality of this disease is due very largely, if not exclusively, to the measures which are directed to the relief of those earliest manifestations of the disease. A few hours after the aperient is swallowed, the patient is seized suddenly with a new and more intolerable agony, vomiting occurs, the abdominal wall becomes rigid, tenderness spreads rapidly across the lower part of the belly, and at last is everywhere present; the pulse rises steadily, and all the signs and symptoms of an acute peritonitis are ushered in without delay. When an operation is performed, a gangrenous appendix, very probably adherent near its attachment to the cecum is found, and the peritoneum already extensively and severely attacked by an acute inflammatory process, replies to the insult by pouring out freely, a thin, clear, sterile, and actively bactericidal fluid. The only exception, in which delayed operation is justifiable and advisable, is where the patient is seen upon or after the third day's illness, presents vomiting, general abdominal tenderness, absence of peristalsis, marked abdominal distention, slight cyanosis, with rapid pulse and a dry coated tongue. In such cases, operation is attended with great risk so that the better plan is to place the little one on the combined Murphy-Ochsner-Fowler-Alonzo Clarke-Crile method of treatment.*

As to the operation itself, neither the method of approach nor the question of drainage can be formulated by will. However, it can be said that drainage is not needed in cases which show a small amount of turbid fluid without odor. Actual pus should of course, be drained. An abscess localized in the right iliac fossa, is preferably opened by an oblique incision placed near the anterior superior iliac spine, dis-

*In a publication, "Essays on Surgical Subjects," by Moynihan, there is a treatise which deals with Acute Emergencies of Abdominal Disease. It is, in fact, this article which stimulated in me the impetus to further investigate the subject of appendicitis in children, by checking up the data and throughout this paper I have quoted this eminent surgeon freely.

regarding the muscle fibers, opening the abscess cavity well to the outside. Thus the general peritoneal cavity is not opened and the lower portion of the ileum does not come into the field of operation. Rarely, a hernia may result from this incision, but lives will be saved.

In dealing with the treatment of appendicitis in childhood, the effects of the disease on the female pelvic organs are to be considered. In young girlhood, the infection must be regarded not simply with reference to the diseased appendix itself, but to the serious harm which it may exert on the pelvic organs if left to work out its own destiny in a state of chronic inflammation. Early operation is therefore indicated in children when there is any suspicious evidence of appendicular infection. In the acute stage, the appendix should be removed immediately to forestall if possible a secondary involvement of the adnexa. If pus is present, every effort should be made to drain the pelvis, it being feasible in certain cases to drain the pouch of Douglas through the vagina. Excepting in cases of localized abscess, it is advisable to make a median line incision in order that the pelvic organs may be inspected and that any abnormalities of position or plastic adherence may be remedied by a proper surgical procedure.

POSTOPERATIVE TREATMENT

The simple cases are properly fed, otherwise, "let the patient get well himself." The postoperative cases of peritonitis should receive the same careful nursing treatment as before operation or those where operation is deferred. Except that Fowler's position should be maintained for only a day or two, the crowding of the intestines down in the pelvis in this position favors obstruction which together with subdiaphragmatic abscess and secondary abscess stand out more prominently as postoperative complications than among adults. Otherwise, the complications following operations in infantile appendicitis are the same as those incident to any abdominal operation in the adult. When intestinal peristalsis has returned as evidenced by auscultation and passage of flatus, enteroclysis is discontinued, and fluids may be given by mouth. Drainage should not be removed too early. There is no hurry. "Better let the drainage rot out than remove it too soon" (Deaver). It may be laid down as a rule that the only proper treatment for any grade of appendicitis, no matter what the age of the patient, is removal of the appendix.

CONCLUSIONS

1. The anatomy of the abdomen of the child differs materially from that of the adult.

2. Mortality rate is alarmingly high and apparently on the increase.

3. Early diagnosis is essential and the younger the child the more difficult the diagnosis.

4. The combined Murphy-Ochsner-Fowler-Alonzo Clarke-Crile treatment is the best treatment in peritonitis cases both before and after operation, or where operation is deferred.

5. Early removal of the appendix is the only proper treatment.

Finally: I am entirely in accord with the views of Moynihan as expressed by him when he says, "I have come to the firm conclusion that in spite of the undoubted advantages which may in many cases accrue from the starvation plan of treatment in acute appendicitis, early or instant operation is always desirable. If the surgeon when he is called in consultation, hears that a purgative has been given, that alone should, in my judgment, decide him to advise immediate operation. In children especially, there must be no exception to this law. An acute attack in a child should always be treated surgically, for the usual signs and symptoms present in an adult are conspicuously lacking here. I make and admit no exceptions to the rule that in acute appendicitis in children, urgent and early operation is essential. And by some means or other, parents should be made to know that the dosing of children with aperients is an evil, and that they must put a check upon those 'philo-cathartic properties' which seem inseparable from motherhood." Moynihan asserts that he would like to have the power to write in every nursery in the world in large letters in the most prominent place the two words "avoid aperients." Perhaps the warning and appeal might be brought home a little more forcibly in an amended edition of nursery rhymes:

Purgation means perforation,
With the appendix kinked and bad;
Both food and drink will worry him,
And aperients drive him mad.

BIBLIOGRAPHY

(1) *Churchman:* Johns Hopkins Hospital Bull., 1909, xx, 31. (2) *Lower:* Jour. Am. Med. Assn., June, 1923. (3) *Kelly, T. H.:* Ill. Med. Jour., 1923, xliii, 454. (4) *Deaver:* Excursions into Abdominal Subjects, p. 117. (5) *Brown, G. V.:* Detroit Med. Jour., October, 1909. (6) *Finney:* Old Dominion Jour. Med. and Surg., 1910, x, 153. (7) *Brenneman:* Surg., Gynec. and Obst., xxxiv, 334. (8) *Graves:* Arch. Surg., 1921, ii, 315. (9) *Porter:* Cal. State Jour. Med., 1918, xvi, 10. (10) *Adams and Berger:* Jour. Am. Med. Assn., 1922, lxxix, 1809-1814. (11) *Moynihan:* British Med. Jour., April 1, 1911. (12) *Wheeler:* West Virginia Med. Jour., 1922, xvii, p. 41. (13) *Alexander:* Penn. Med. Jour., 1920-1921, xxiv, p. 135. (14) *Abt:* Arch. Ped., 1917, xxxiv, 641. (15) *Stout:* Jour. Okla. Med. Assn., 1923, xvi, p. 11. (16) *Brunig:* Arch. Jour. Klin. Chir., 1921, cxvi, 598. (17) *Schelling:* Med. Klin., 1908, iv, 1722.

13,300 Woodward Ave.

(*For discussion, see p.* 549.)

THE FIELD OF PARTIAL GASTROENTEROSTOMY IN THE TREATMENT OF ULCERATION OF THE STOMACH AND DUODENUM*

By W. Wayne Babcock, M.D., Philadelphia, Pa.

TO ME, as perhaps to many abdominal surgeons, the operative treatment of peptic ulcer brings unpleasant memories. In 1901, twenty years after its introduction by Wolfler, and eight years after Doyen first used it for ulcer, the operation of gastroenterostomy was proclaimed the one safe and reliable method of treating ulcer of the stomach and duodenum. We found it neither. True, the immediate operative mortality in the hands of certain surgeons was low, but the unpublished history of gastroenterostomy for the following ten years would form a rather ghastly record. It is the old story that the hand of the learner in surgery is heavy and patients suffer for the development of judgment and skill. We learn by experience, with worry and mental anguish, but the patient, unfortunately, pays in physical suffering and sometimes death. We soon found that gastric symptoms without ulcer or obstruction were not relieved but made worse by the operation. Here was an operation that made well persons ill. Particularly was the operation unsuccessful when attempted for the gastric symptoms of pulmonary tuberculosis, of cardiac, renal, biliary or appendiceal disease or a neurosis. With multiple experiences and much suffering, the technical dangers were gradually overcome. After one of my first gastroenterostomies, the small intestines entered the lesser peritoneal cavity, broke through the gastrocolic omentum and were found hanging over the transverse colon. Another patient with a fatal postoperative obstruction taught me the danger of slight twists in the long axis of the jejunum produced by the anastomosis. From a thousand surgeons such experiences could be greatly multiplied. Unfortunately, there was no general surgical clearing house, and each operator worked out the problem in ignorance and agony.

The direction of the new stroma early attracted attention and curious discrepancies are recorded. The Mayos reported trouble if they followed the direction used by Moynihan, while Moynihan reported perfect results if he did not make the incision in the stomach in a direction from above downward and to the left, as used by the Mayos. In the twenty years that have followed the early, very enthusiastic reports as to gastroenterostomy, we have been taught the importance

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Ohio, September 18 to 20, 1924.

of making the opening of sufficient size, of placing it low, and not too close to the pylorus, of having the jejunal loop not too short for fear the stomach will drag upon it when empty or distended, nor too long for fear a kink and vicious circle may develop, of having the opening in the mesocolon of ample size with edges so carefully attached to the stomach that the jejunum or other part of the small intestine may not enter the lesser peritoneal cavity, of the avoidance of axial rotation of the jejunum, of careful hemostasis of the cut edges, the importance of absorbable sutures in the mucosa and the dangers of mechanical devices for anastomosis and of traumatism to the stomach or bowel. With this comes emphasis of the fact that safety in gastric surgery depends as much upon developed art as science, and art only comes with experience. We may know what we should do, but if we have not developed the art to carry it out, our results will be poor. Perhaps this is evident in the surgery of the stomach as in no other part of the body invaded by the general surgeon. While we may have overcome the early technical dangers of gastroenterostomy, other and late complications come back to plague our patients, even to the horrible true fecal vomiting from the perforation of a jejunal ulcer into the colon.

We have passed the period of pride that comes from a low primary operative mortality. The true mortality of an operation is the sum of the mortalities the operation engenders. To the immediate mortality of gastroenterostomy should be added the mortality of the secondary ulcerations, obstructions, herniations, perforations, malignant degenerations which a more effective operation would have prevented. Of great value are candid appraisals of the ultimate results of the various operations for ulcer performed by highly skilled surgeons in the best environment. Statistics thus obtained, while above the average, give values to guide the general surgeon.

DUODENAL ULCER

Some of our problems would be solved if Balfour's excellent recent study of one thousand patients ten years after gastroenterostomy for duodenal ulcer could be duplicated with each of the operations suggested for peptic ulcer. But even ten years is not sufficient to exclude all complication. I have just learned of the fatal perforation of a duodenal ulcer thirteen years after I did a Finney operation. As gastroenterostomy has been for many years the surgical sheet anchor of treatment, no operation should be considered for ulcer that does not offer equally good results. Balfour reports that 1.74 per cent of the patients with duodenal ulcer died from the operation, while 12 per cent more were not relieved, indicating that the operation was unsatisfactory in about one case in seven. Recurrent ulcer was found in 3.5 per cent, vomiting in 2.5 per cent, pain more

or less severe in 9 per cent. True, many of us may complain that our personal results with gastroenterostomy for duodenal ulcer are not as good as those quoted, but this perhaps should drive us to criticise not the method, but ourselves. But the best results from gastroenterostomy do not satisfy us and we must look upon this unphysiologic operation as a makeshift marking a transition period in the development of gastric surgery. Competing operations in the treatment of duodenal ulcer are local excision, forms of pyloroplasty and partial gastrectomy. The selection of the patient and the type of ulcer treated may greatly modify the final result obtained and should be indicated in published statistics.

No operation for duodenal ulcer can be considered that does not offer at least as good results as gastroenterostomy, which at the best leaves about one patient in seven dead or unrelieved. While better

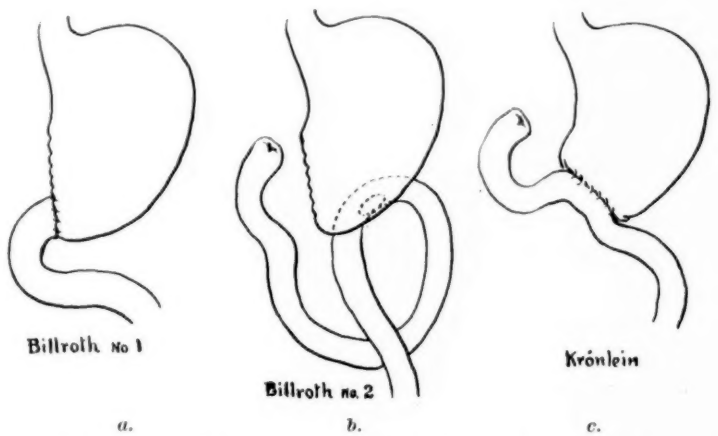
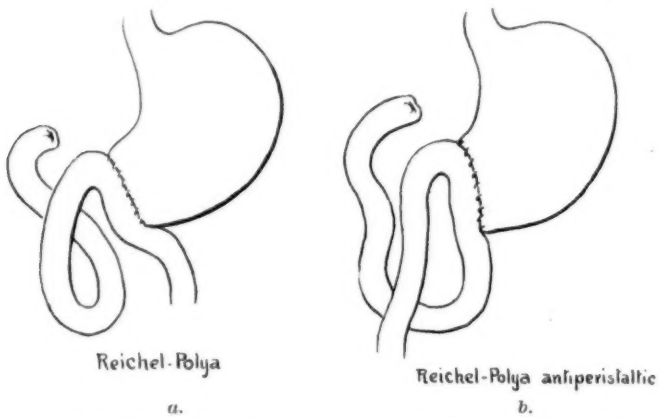


Fig. 1.—Types of partial gastrectomy. (*a*) Billroth No. 1. End-to-end union with duodenum united at lower end of gastric incision. (*b*) Billroth No. 2. End of duodenum and stomach closed with separate gastroenterostomy. (*c*) Kronlein Operation of 1887. End of duodenum closed. Divided end of stomach implanted in the side of a loop of jejunum.

results are devoutly wished, except for the avoidance of jejunal ulcer it has not been proved that they follow simple excision, cauterization, the various methods of pyloroplasty or pylorectomy. We await further evidence that more can be expected from partial gastrectomy. While certain of the deep and perforating ulcers are not relieved, other chronic duodenal ulcers with dense adhesions or partial obstruction, often difficult to handle by other operations, are especially amenable to gastroenterostomy. The exclusion or division of the pylorus is not essential for good results. Indeed, after elimination of the pylorus the duodenum may dilate and show increased ulceration from the chronic reflux of acid chyme. For the small, more superficial and more acute ulcer in younger persons, while gastroenterostomy is less effective, gastrectomy seems disproportionately severe. It is sur-

prising that the immediate mortality of partial gastrectomy for ulcer compares favorably with that of gastroenterostomy. Using partial gastrectomy for gastric, but not for duodenal ulcer, Moynihan reports a primary mortality of only 1.6 per cent. Finsterer, despite his massive resection of at least one-half of the stomach, reports only three deaths in one hundred and sixty-eight gastrectomies for duodenal ulcer, a mortality of 1.8 per cent. (Fig. 4.) Obviously, the primary mortality from resection may so closely approximate that from gastroenterostomy that the selection of the operation will rest upon the late results of the two operations. Until we know more as to the best method of gastrectomy and more as to the undesirable late complications from the operation, it seems wise to use the resection only in selected cases of duodenal ulcer. If the ulcers are deep, large or perforated, if gastric ulcers are associated, if a jejunal ulcer develops, if the duodenal ulcers progress or are unrelieved by operation,



a. *b.*

Fig. 2.—(*a*) Reichel-Polya. Gastrectomy. End of duodenum closed with retrocolic anastomosis between end of stomach and side of jejunum. (*b*) Reichel-Polya operation with loop of duodenum so turned as to produce an antiperistaltic anastomosis.

then partial gastrectomy should be considered. Often the operative difficulties of gastrectomy are greatly increased by an adherent duodenal ulcer.

GASTRIC ULCER

Against gastric ulcer and especially large, adherent, posterior or saddle ulcers, the operation of gastroenterostomy has been far from satisfactory. The mortality at the Mayo Clinic, when combined with local excision of the ulcer is about 4 per cent. From 62 to 82 per cent of the patients have a symptomatic cure. The death rate during the first four years after operation for duodenal ulcer is practically normal, while after operation for gastric ulcer it is three times the normal.* To the usual secondary complications of gastroenterostomy are

*Judd and Lyon, Papers of Mayo Clinic, 1922, page 78.

to be added the percentage of unhealed ulcers and their complications, including carcinoma. Secondary carcinoma of the stomach is rare after resection of the stomach for benign ulcer, but has been observed by many surgeons after gastroenterostomy with or without local excision or destruction of the ulcer. Judd and Lyon report ten cases of gastric carcinoma from the Mayo Clinic found at operation after previous local excision of the ulcer, but no cases after resection of the stomach in continuity for ulcer (loc. cit. p. 78). I have seen three cases of carcinoma after gastroenterostomy for gastric ulcer. There is, therefore, much more reason for considering partial gastroenterostomy for gastric than for duodenal ulcer. Haberer and Finsterer and other continental surgeons who report very poor results from gastroenterostomy for both duodenal and gastric ulcers have turned to gastrectomy. Moynihan with the remarkably low mortality of 1.6 per cent for partial gastrectomy, while using gastroenteros-

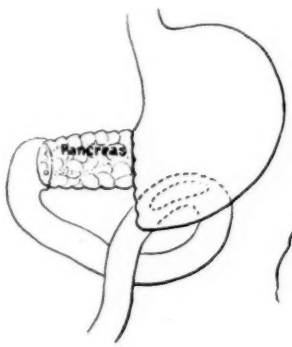


Fig. 3.

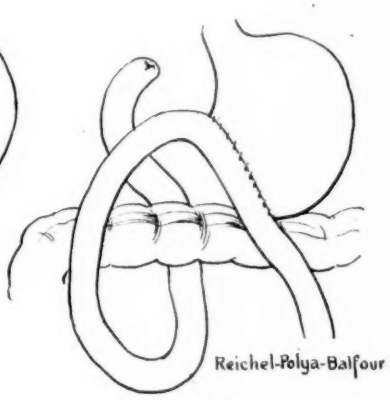


Fig. 4.

Fig. 3.—Resection of head of pancreas, the end of the pancreas being invaginated into the end of duodenum. In association with Billroth No. 2 partial gastrectomy.

Fig. 4.—Balfour modification of the Reichel-Polya operation, the anastomosis being antecolic.

tomy for duodenal ulcer, rejects it in favor of an anterior Polya type of partial gastrectomy for gastric ulcer. Granting that a partial gastrectomy is the proper operation (and we are coming to this viewpoint) for gastric ulcer, there is no unanimity among surgeons as to the best type of resection. Operations with the Murphy button, or other mechanical devices, are of historic interest only. The Billroth II closure of the gastric opening and separate gastroenterostomy and the Kocher method of end-to-side anastomosis of duodenum in the posterior wall of the stomach with separate closure of the gastric stump, continue the disadvantages of gastroenterostomy and may be eliminated as routine operations. (Fig. 1.) The Billroth I partial gastrectomy, in which the end of the duodenum is implanted in the lower angle of the gastric stump, and its modifications by which an end-to-end union is ob-

tained, is the most physiologic type of gastrectomy. After this operation, the chyme, as is normal, first passes into the duodenum, which is especially adapted to neutralize and withstand this acid and erosive liquid. While it is probable that the danger of atrophy or degeneration of the pancreas mentioned by Borodenko when the chyme is made to enter the bowel below the duodenum has been exaggerated, it is obvious that the production of the normal duodenal hormone with secondary stimulation of the pancreas and liver best approximates the normal when the stomach empties directly into the duodenum. If the muscle of Oschner is not divided a substitute for the removed pylorus remains, regulating to some degree the escape of food from the stomach and serving to maintain the ileopyloric reflex. Through this reflex, overloading of the small intestine by rapid and unregulated emptying of the stomach is prevented. The danger of marginal ulcer

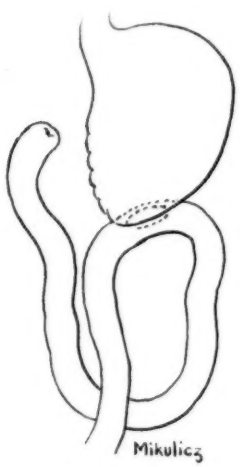


Fig. 5.

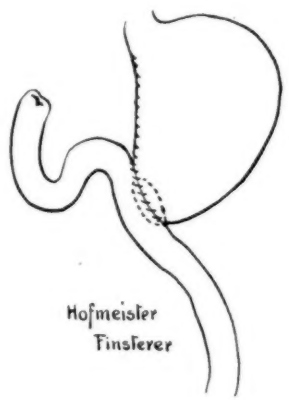


Fig. 6.

Fig. 5.—Mikulicz' operation: End of duodenum closed, anastomosis of stomach to jejunum on greater curvature of stomach adjoining lower angle of gastric incision, to ensure dependent position of the new stoma.

Fig. 6.—Hofmeister-Finsterer resection: End of duodenum closed, resection of one-half or more of the stomach, side of jejunum anastomosed to lower end of gastric incision.

increases when the anastomosis is made into the jejunum. To obviate this, Finsterer reduces the proteolytic activity of the stomach by removing one-half or two-thirds of the organ, and mentions four cases of jejunal ulcer after resection of less than one-half of the stomach.

We are hopeful that time will show that such massive resections of the stomach are not necessary to prevent intestinal ulceration when there is direct union of stomach to duodenum. And Finsterer has more recently turned back to the Billroth I operation. With the resection and anastomosis to the jejunum as in the Billroth II, Reichel-Polya, Reichel-Polya-Balfour, Hoffmeister or Hoffmeister-Finsterer operation, one must also guard against the other complication of anterior

and posterior gastroenterostomy, i.e., herniation into the lesser peritoneal cavity, herniation through the jejunal loop, angulation and torsion of the jejunum and also particularly if a long loop is employed, reflux distention, ulceration and opening of the duodenal stump. William Mayo has mentioned two cases in which the sutured end of the duodenum gave way and a number of instances are recorded in foreign literature in which either the excluded duodenum opened or ulcerated. Finsterer fearing this, after carefully dividing and closing the duodenum, embeds it behind the peritoneum.

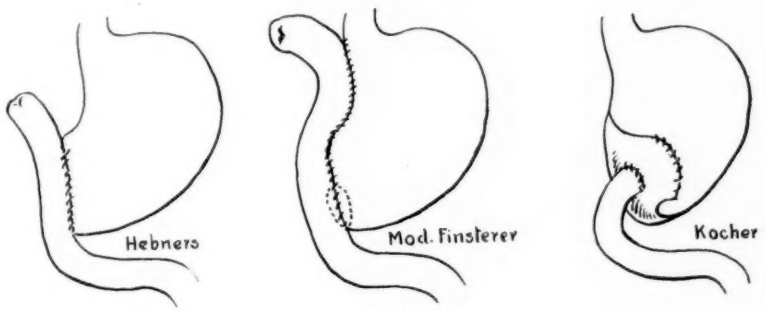


Fig. 7.—(*a*) Hebner's operation. Duodenum closed, end of stomach united to side of duodenum. (*b*) Finsterer's operation modified by suturing side of duodenum over line of gastric union to reinforce it. (*c*) Kocher's operation. End of stomach closed, posterior end to side anastomosis between end of duodenum and posterior wall of stomach.

Fig. 8.—Modifications of Billroth No. 1 used in author's series. (*a*) Duodenum anastomosed in upper angle of gastric incision. (*b*) Duodenum anastomosed to midportion of gastric incision. (*c*) Duodenal opening enlarged by splitting inner side of duodenum with combined end-to-end and side-to-side anastomosis of duodenum to stomach.

The complications of the end-to-end anastomosis include leakage at the so-called fatal angle, now overcome by better methods of suture, separation at the line of anastomosis and late contraction and obstruction of the new opening. In about fifty resections for carcinoma and ulcer with end-to-end suture we have had none of these complications. To prevent tension on the suture lines, we divide the peritoneum over the anterior surface of the duodenum and reflect it to the right, as the right side of the duodenum is mobilized after the method of Kocher. With the stomach mobilized by sufficient division of the gastrohepatic

omentum, and the division of the gastric artery, it is usually quite feasible to make an end-to-end union even with the removal of two-thirds of the stomach. By finally turning the flap of the peritoneum over the suture line and fastening it to the anterior face of the stomach, the stomach is held to the right and tension is relieved at the line of anastomosis. At times an anterior omental reinforcement is used. We have probably escaped the more usual trouble of a late contraction and obstruction of the new stoma by avoiding clamps and the limitations they impose, and stretching the opening of the duodenum to fit the largest possible opening of the stomach. If the division of the stomach is not much too oblique, or the stomach much dilated, a direct end-to-end union of the duodenum to the stomach can often be made.

Contrary to the reports from abroad, as to the typical Billroth I operation, the postoperation course has been remarkably smooth in our small series, fully as good as after gastroenterostomy. In one patient, an associated proximal cholecystogastrostomy evidently by traction led to a partial obstruction, necessitating an operation after the patient had left our care. With this exception, none of our patients have required reoperation and none have developed symptoms that we could attribute to union of stomach and duodenum. In cancer, where the tumor has recurred, it has shown no special tendency to obstruct the new opening. We have not placed omentum behind the suture line to prevent adhesions of the pancreas as suggested by William Mayo.

The duodenum is fragile, easily crushed or torn, and we have preferred to operate without clamps. This has given us greater mobility in the end-to-end anastomosis. If the acid values were low, we have cleansed the exposed mucosa with swabs moistened with ½ per cent hydrochloric acid in salt solution, or have even injected the solution through the walls of the stomach and duodenum with a fine hypodermic needle preliminary to the section. Patients with hypochlorhydria also have been given dilute hydrochloric acid by mouth before the operation. These precautions are, of course, rather rarely required in ulcer, but we feel they have reduced the danger of peritoneal contamination and especially subcutaneous suppuration from contact with fetid or bacteria-laden contents in carcinoma. Of course, in ulcers with high acid values, infection is unusual. We have found that bacteria are squeezed through the intestinal wall when crushing clamps are applied. Crush an unopened appendix in a clean abdomen and note the luxuriant culture of colon bacilli you obtain from the clamp.

PARTIAL GASTRECTOMY FOR ULCER WITH TELESCOPIC ANASTOMOSIS

The mucosa of the stomach is lightly attached to the overlying muscular coats and is easily separated by blunt dissection with the division

of relatively few, and rather small vessels, provided the layers have not been fastened together by some form of gastritis. It is quite feasible, therefore, to increase the effect of the gastrectomy by resecting the gastric mucosa well above the line of section of the outer wall of the stomach. In this way we can remove more of the ulcer-bearing and acid-activating portions of the mucous membrane with a smaller gastric resection, and by telescoping the end of the duodenum into the stomach and anastomosing it to the divided mucosa of the stomach,

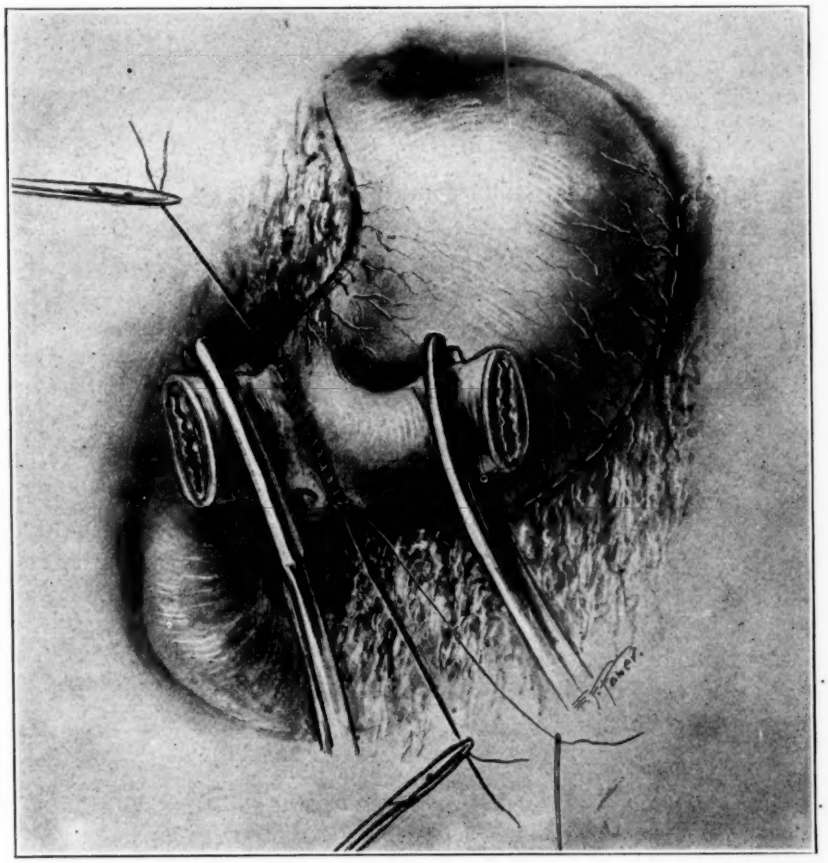


Fig. 9.—Telescopic anastomosis first stage,—posterior serous suture introduced.

produce a strong reinforced union. In certain cases, the complete sheathing tube of serous and muscular coats of the stomach is not used, but only sufficient of the posterior wall to reinforce the posterior part of the anastomosis. In this form of gastrectomy, we first mobilize and isolate the upper part of the duodenum and the lower part of the stomach in the conventional way. The duodenum is divided and if about one-third of the stomach is to be removed, guide sutures are so introduced as to connect the upper and lower borders

of the stomach and duodenum about two or more centimeters distant from the line of proposed section. These guide sutures stretch the duodenum against the wider posterior face of the stomach. The posterior serous surfaces of the stomach and duodenum are united; the spacing of the gastric sutures being about three times as wide as the duodenal. (Fig. 9.) The posterior wall of the stomach distal to the suture line is now incised down to the mucosa. With a pair of dissecting

Fig. 10.—Telescopic anastomosis No. 2. Seromuscular walls of stomach partially divided with separation of mucous from muscular layer of the stomach.

scissors the gastric mucosa is now separated to a level two or more centimeters above the divided muscular wall, and the tube of gastric mucous membrane thus formed amputated at this higher level. (Fig. 10.) Hemostasis being completed, the end of the duodenum is now turned into the stomach and united to the cut edge of the gastric mucous membrane with perhaps a second intermediate row of sutures. With this suturing also the spacing is much wider on the gastric than the duodenal side, so that the two tubes of greatly different diameters are made to fit in

end-to-end fashion. It is sometimes desirable to split down the upper on the left side of the duodenum to enlarge its terminal opening, but if one works without clamps and carefully spaces his sutures, it is surprising what a good approximation of the larger and smaller openings may be effected. The operation is completed by continuing the one or two outer rows of sutures over the anterior face of the anasto-

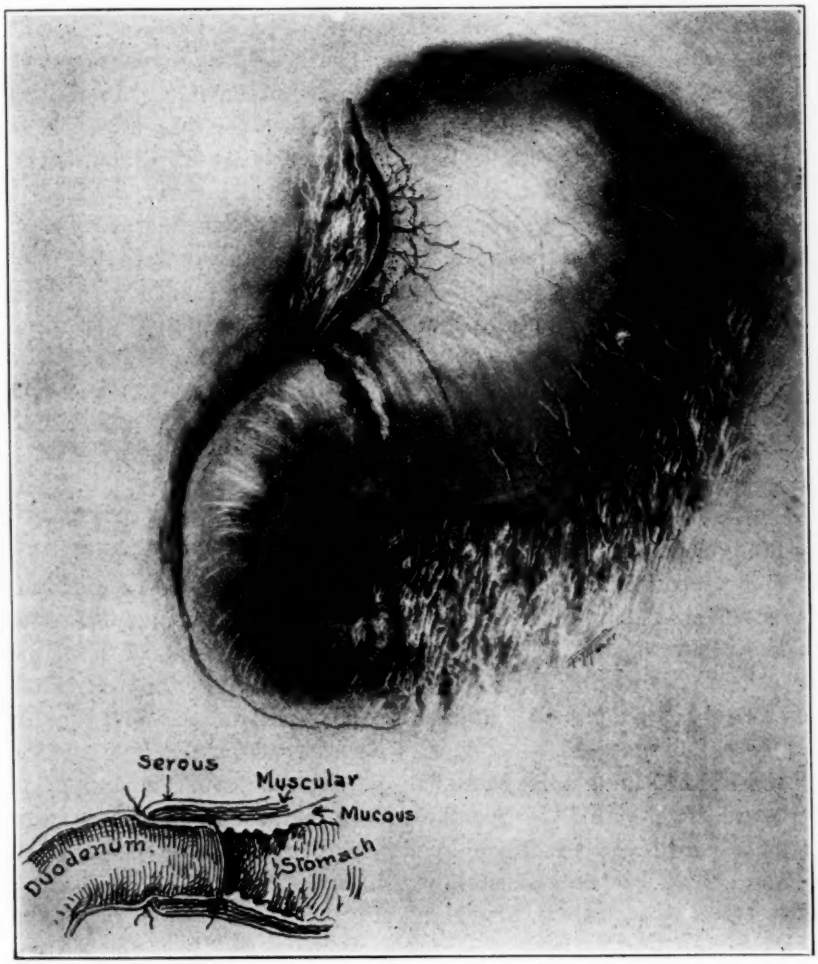


Fig. 11.—Telescopic anastomosis continued: The cuff of the gastric mucosa has been divided at a level several centimeters higher than that of the division of the muscular and serous coats of the stomach. If the mucosa proves to be adherent, a soft clamp is applied on the stomach at the upper edge of the proposed resection, and the mucosa removed by a sharp curette up to the clamp. The cut end of the duodenum is invaginated into the stomach and united by a continuous suture to the divided edge of the gastric mucosa. The anterior seromuscular layer of the stomach is brought down over the duodenum and united by completing the posterior lines of suture.

mosis. (Fig. 11.) The anterior part of the gastric intussuscipiens is split or resected if necessary to produce a satisfactory anterior closure. The chief objection to the operation has been the time required.

We have used partial gastrectomy for ulcer, or its complications, twenty-five times. There has been no operative mortality in this series. The first patient had a gastroenterostomy in 1906, for prepyloric ulcer; a Billroth II gastrectomy in 1907, and one or two years later died with gastric symptoms, possibly a marginal ulcer or cancer. We have no other evidence of secondary carcinoma in the series. Spinal anesthesia was used in nineteen cases, narcotic and local anesthesia in four and spinal continued with local in two cases. The youngest patient was twenty-seven years, the oldest seventy years of age. Seven of the patients were women, eighteen men. In nineteen patients, forms of end-to-end anastomosis between the stomach and duodenum were employed. The end-to-end operation included the largest resection, three-fourths of the stomach being removed for an enormous adherent ulcer, considered to be malignant, until the histologic examination was made. This patient has progressively gained in weight, and apart from her limited capacity for food, has been free from digestive symptoms during the seventeen months that have elapsed since operation. Two coat-sleeve resections are included in the series. One with an associated pyloroplasty for a marked hourglass contraction from ulcer in a woman of seventy, has given excellent results in the four years that have elapsed. In the second coat-sleeve resection, a cholecystogastrectomy was associated, and one-third to one-half of the stomach removed. This patient, a man of fifty-nine, operation in 1920, had a subacute perforation and an associated cholecystitis and made a good recovery. A second case of hourglass stomach from saddle-shaped ulcer with a posterior perforation into the pancreas and an anterior perforation plugged by omentum, occurred in a woman of forty, and was treated by partial gastrectomy and end-to-end anastomosis in 1921. This patient has since gained twenty-five pounds and has passed through pregnancy.

Three of the duodenal ulcers had perforated into the wall of the gall bladder. Five of the gastric ulcers and three of the duodenal ulcers had produced pyloric obstruction. Three of the patients had had a previous gastroenterostomy, one in 1911, as the first stage of the gastrectomy. One patient had a previous excision and Finney operation. In one patient, the operation being in 1914, there was a large adherent duodenal mass with invasion of the head of the pancreas. Suspecting malignancy, I cut off the head of the pancreas, ligated the vessels individually and implanted the head of the pancreas in the open end of the divided duodenum, the partial gastrectomy being completed by a gastroenterostomy. This patient has made a good recovery. Two patients had incision of the wall of the transverse colon by a marginal ulcer.

While this series is small, it is significant that it represents the worst cases of gastric and duodenal ulcer we have seen during the

last seventeen years. Despite the complications from the disease and the severity of the operation, it is noteworthy that the patients have had better and more uniform recoveries than contemporary patients I have treated by gastroenterostomy or other means.

SUMMARY

Primary gastrectomy for peptic ulcer, while often a tedious and difficult operation, has a low primary mortality, comparing well with the mortality of other radical methods for treating ulcer. The convalescence after partial gastrectomy is, as a rule, as smooth as after a simple gastroenterostomy; and there is reason to believe that the secondary morbidity of partial gastrectomy, especially for gastric ulcer, is less than from gastroenterostomy with or without local excision.

Partial gastrectomy for ulcer is yet in the developmental stage and the best method of resection remains to be determined. Sufficient development has been obtained, however, to warrant the large replacement of other operations now done for gastric ulcer by gastrectomy.

For duodenal ulcer, at present, the field of partial gastrectomy may be considered more limited; however, for certain forms of duodenal ulcer not amenable to treatment by gastroenterostomy, partial gastrectomy is the operation of choice. For recurrent ulcer or jejunal ulcer following gastroenterostomy, partial gastrectomy is most valuable. As gastroenterostomy tends to make a well person sick, a partial gastrectomy should not incorporate its physiologic errors. The most physiologic type of partial gastrectomy is a modification of the Billroth I, and every effort should be made to develop this into safe, reliable operation. Gastrectomy marks a developmental phase in the evolution of gastric surgery, and its disadvantages are such that we should aim to supplant it as soon as possible by better operative methods. Thanks to our inventive surgical bellwethers, surgery of the stomach remains quite traumatic. Fasten a leader's name to any bruising, crushing, burning device and it will soon be found in clinics throughout the land. Besides the stomach, only hemorrhoids are now treated with equal surgical brutality.

2008 WALNUT STREET.

(*For discussion, see p.* 555.)

EXHIBITION OF CHARTS ILLUSTRATING POINTS IN DIFFERENTIAL DIAGNOSIS IN CERTAIN ABDOMINAL CONDITIONS*

By Robert T. Morris, M.D., New York, N. Y.

THE diagnosis of acute appendicitis is readily made for the most part nowadays. Sometimes one will make a mistake and find himself dealing with an ovarian abscess or with pyosalpinx.

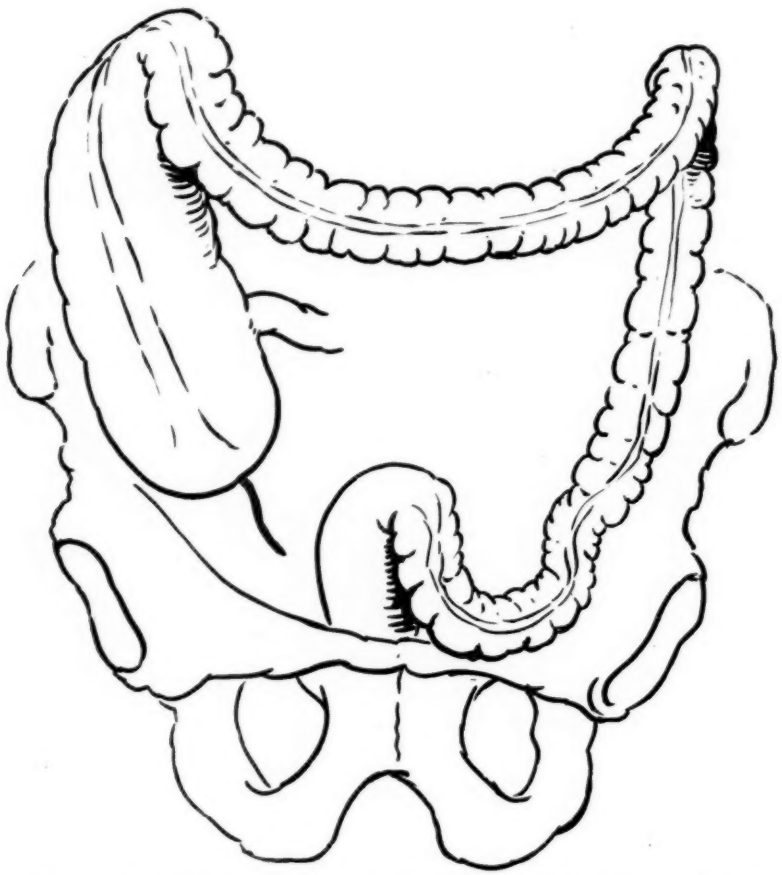


Fig. 1.—Distended ascending colon characteristic of chronic appendicitis.

Chronic appendicitis on the other hand occurs in the form of at least four kinds which have no particular relation to each other in their pathologic history and yet give very much the same symptoms.

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Ohio, September 18 to 20, 1924.

Two of these signs are so characteristic, that they stand regularly for chronic appendicitis when they are found, no matter which one of the four kinds is involved.

One of the four kinds is a chronic infective lesion usually associated with some other chronic involvement of the enteron in the vicinity. Because of the degree of phagocyte protection called out by this chronic inflammation acute attacks are not likely to occur.

The other three common forms of chronic appendicitis are irritative lesions and not infective lesions. Among these the one which occurs

Fig. 2.—Schematic drawing of fused ganglion of lumbar sympathetic group, right side.

most frequently is the so-called normal involution of the appendix. This occurs in greater or lesser degree with the majority of people late in life, but we find it not infrequently occurring early as one of the stigmata of physical decline in patients who carry other common stigmata at the same time. For example women with the narrow costal angle, short sternum, high arched palate, loose kidney and relaxed peritoneal supports are prone to have this condition as well as a congestive form of chronic appendicitis belonging with prolapse of the bowel.

Removal of the appendix in the chronic infective lesion of appendicitis commonly gives good relief but removal of the appendix in cases of normal involution not only does not assure relief but it may introduce still further troubles if the cecum is left more mobile than it was before the appendix was removed.

Another form of appendicitis relates to scars left after the passing of acute appendicitis. This irritative form, like the preceding one

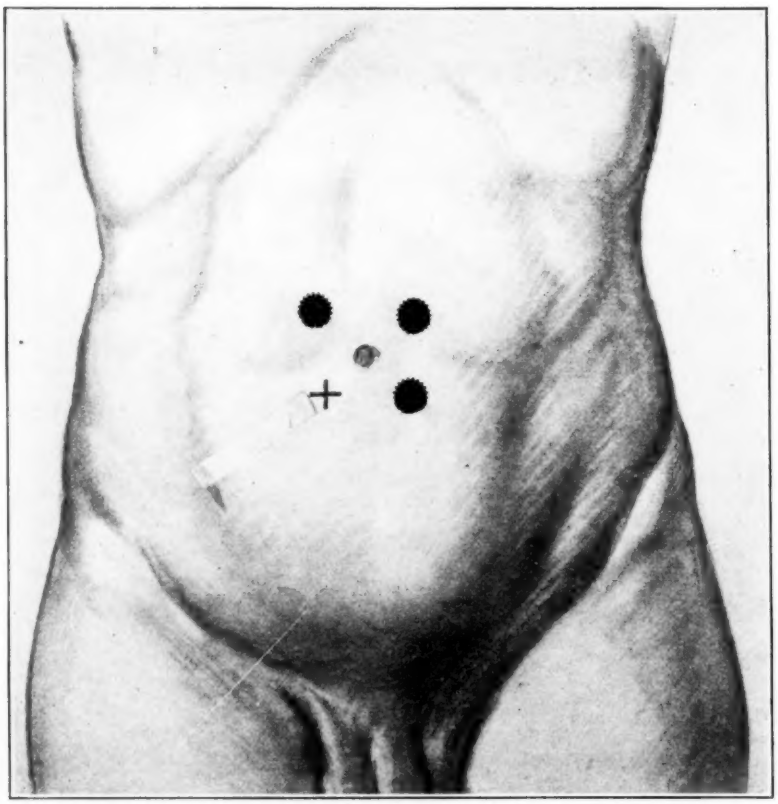


Fig. 3.—Star marks site of fused ganglion. This ganglion when hypersensitive on deep pressure gives the most important single diagnosis sign of chronic appendicitis. Dots mark other ganglia that are also hypersensitive in this condition.

causes symptoms, because nerve filaments which remain in contracting connective tissue send impulses to the fused ganglion in such a way that it becomes chronically hypersensitive.

The third form of irritative lesion belongs to the lymphoid appendix. Hypertrophy of the soft inner coat of lymphoid tissue within the tight outer container of the peritoneum causes transitory disturbance. This form of appendix occurs in patients who have what is called status lymphaticus. We very often find it associated with enlarged tonsils and large lymph glands in other parts in the body, status

lymphaticus occurring much more frequently than is generally supposed to be the case.

In all these kinds of chronic appendicitis there is seldom pain or tenderness on pressure directly at the site of the appendix itself. Tenderness on deep pressure is found over the second and third sympathetic lumbar ganglia on the right side. Deep pressure a couple of inches to the right of the navel and a trifle below brings out this point.

On the accompanying charts the appendix itself is shown at a point where tenderness on deep pressure does not often occur, but if we note the position of the fused ganglion we shall observe where pressure is to be made.

The other important diagnostic point in all four kinds of chronic appendicitis is what I have called the cider barrel sign. Percussion over the normal left side of the abdomen brings out a note suggestive of the cider barrel in October and percussion over the distended ascending colon on the right side on the other hand brings out a resonance suggestive of the cider barrel in March.

Noting the position of the left fused ganglion we are to remember that when this is hypersensitive on deep pressure as well as the right fused ganglion we are to leave the appendix out of the question, for the moment at least and to look to the pelvis as the source of irritating impulses. Passing to the point which shows the first sympathetic lumbar ganglia on the right side we find what is called Mayo-Robson's point. This ganglion is hypersensitive with chronic infection of the gall bladder. When there is hypersensitiveness of the first left sympathetic lumbar ganglion we are to look for chronic gastric conditions.

These points will allow us very nicely to separate appendix conditions from pelvic conditions and gall-bladder and gastric conditions in cases where other symptoms and signs occurring at the same time might mislead the diagnostician.

114 EAST FIFTY-FOURTH STREET.

(*For discussion, see p.* 557.)

SARCOMA OF THE OVARY IN CHILDREN AND YOUNG GIRLS*

By Lewis C. Scheffey, M.D., Philadelphia, Pa.

(Assistant Demonstrator of Gynecology, Jefferson Medical College.)
From the Department of Gynecology, Jefferson Hospital.

THE Frequency of Ovarian Sarcoma.—Relative to the frequency of sarcoma in ovarian tumors, one finds slight variation in the statistics of important clinics. Pfannenstiel,[1] in 400 ovariotomies for new growths, found 5.38 per cent; Stauder,[2] reported 4.74 per cent in 295 ovariotomies; Lippert,[3] 2.51 per cent in 638; Olshausen,[4] 4.09 per cent in 293; Jungmann,[5] 4.7 per cent in 280 cases, an average of 4 per cent in 1906 cases. Hubert,[6] in his excellent dissertation, mentioned 1239 cases of ovarian tumors, 47 of which, 3.8 per cent, were sarcomatous. These included cases collected or reported by Cohn, Leopold, Billroth, Schroeder, Von Braun, Haas, and Olshausen. Heinrichs,[7] in 287 ovariotomies collected, found a similar percentage. Hence the average frequency appears to be nearly 4 per cent.

The relative proportion of sarcoma to malignant tumors of the ovary in general appears to be larger. Heinrichs,[7] found 140 cases of sarcoma in a collection of 461 malignant ovarian tumors, 14.5 per cent. Hoon,[8] in 39 cases of ovarian malignancy occurring at the Mayo Clinic from January 1, 1910, to August 1, 1921, reports 2 cases of sarcoma, or 5.1 per cent.

Frequency of Sarcoma of the Ovary in Children.—In reviewing this subject in literature, one finds that the selected age limits vary. Bland-Sutton[9] stated that before puberty 26 per cent of ovarian growths are solid tumors, and reported 60 cases of ovarian growths in children under fifteen years of age, of which 16, or 26.6 per cent, were sarcomatous.

Hubert[6] found 28 cases of sarcoma in 195 cases of ovarian tumors in children up to the age of fifteen—18.3 per cent. Wiel,[10] in 60 cases of ovarian neoplasms in children ten years of age and younger, found 15 cases of sarcoma—25 per cent.

Age.—Temesvary[11] showed the average age of patients with ovarian sarcoma to be 32.2 years; 5.7 per cent were under ten years. The growth was most frequent between twenty-one and thirty; 40 per cent were under twenty-five.

Baccus[12] found the greatest number of cases to be between twenty-one and thirty; 10.2 per cent were under fifteen or were fifteen; 19.8 per cent were twenty and under.

*Read at a meeting of the Obstetrical Society of Philadelphia, Pa., May 1, 1924.

Olshausen,[4] in a collection of 37 cases, found 18, or 50 per cent, between the ages of thirty and forty; 13.5 per cent were under twenty.

Viering[13] reported 8 cases out of 45, or 17.7 per cent, between the ages of twenty-one and thirty, and a similar percentage under twenty.

Lippert,[3] out of 16 cases of ovarian sarcoma, found among the 638 ovariotomies performed at the Leipzig Clinic, reported only 1 case under twenty years—6.2 per cent; 4 cases—25 per cent—were between fifty and sixty.

The reports have varied, therefore, from 6.2 per cent to 19.8 per cent, as to the proportion of ovarian sarcoma found in patients under twenty years of age, but it seems unquestionable that sarcoma of the ovary is most frequent between twenty-one and thirty.

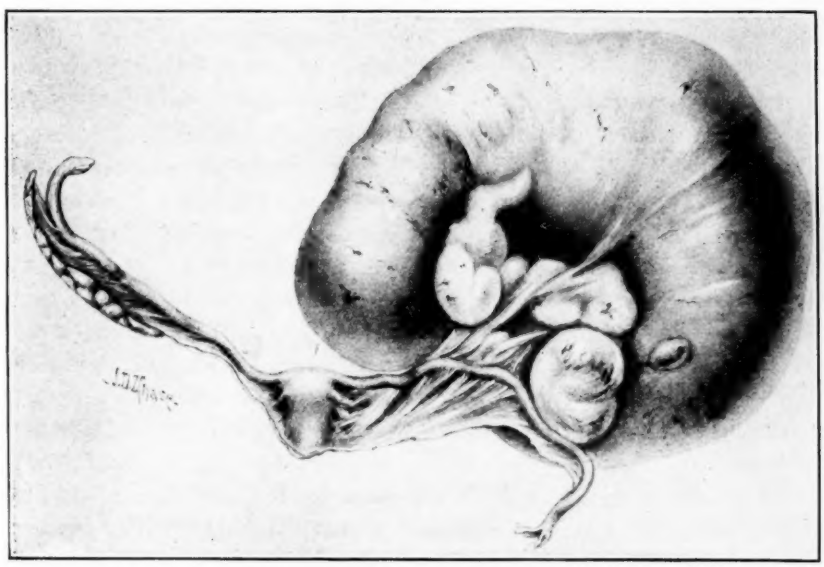


Fig. 1.—Showing the attachment of the ovarian sarcoma to the left adnexa, the elongated tubes, and the atrophic right ovary.

In a recent review of the literature, I found 118 cases of sarcoma of the ovary occurring in infants, children, and young women, up to, and including the age of twenty. To this I have added a case admitted to the Gynecological Service of the Jefferson Hospital, which is reported in detail later in this paper. Of this series, 70 cases, or 58.8 per cent, occurred at or before the age of puberty, taken as fourteen years. Forty-nine cases, or 41.1 per cent, occurred after fourteen and up to and including twenty years of age.

Sexual Precocity—Hyperovarian Function.—Sexual precocity, manifested in one way or another, was observed in 17 of the 69 cases occurring at or before puberty—24.3 per cent. This was made evident by the appearance of periodical vaginal bleeding (precocious menstruation), development of the breasts, appearance of pubic and axillary

hair, and in one case, alteration of the voice. Not all these manifestations were present in every case. In three, there was no vaginal bleeding, even though other premature changes were present. Marked development of the external genitalia was present sometimes, and in several instances the uterus was found enlarged at operation or autopsy. In one case there was decided physical development, far in excess of the age.

In four cases, following operation and removal of the sarcoma, the manifestations of sexual precocity disappeared.

Novak[14] stated that "if menstruation begins and recurs regularly in a girl of less than nine years of age, in this climate, it must be looked on as precocious." All the manifestations found in our series were under that age. He also differentiates "menstruatio praecox," "pubertas praecox," and "evolutio praecox."

Precocious sexual development may occur entirely apart from any demonstrable lesion of the ovary, as well as in association with one. Simple cysts of the ovary have been coexistent; also carcinoma and teratoma. (Brohl,[15] Sacchi,[16] Harris.[17]) In these cases the manifestations disappeared following operation.

Precocious menstruation is not a rare condition entirely. Lenz[18] has collected 130 cases, more recently augmented by others. His collection ranged from birth to seven years of age.

That lesions other than of the ovary may be associated with precocity is readily shown by Hofacker,[19] who collected 62 cases, of which 6 were associated with rachitis, 3 with hydrocephalus, while normal pregnancies occurred in 5 cases between the ages of eight and ten years.

Cases of precocity have been reported in the presence of tumors of the ductless glands, other than the ovary, the majority of which were hypernephroma. (Bulloch and Sequira.[20]) Newman[21] reported 22 cases in association with pineal tumors.

Since the preponderance of evidence shows that sexual precocity, in some form or another, when followed to the operating table or the autopsy room, is generally associated with tumor growths of the ovary, suprarenal, pineal, or thyroid, it seems to follow that the cause lies in actual physiologic interference with the respective internal secretions, either independently or interdependently.

Prochownick[22] reported a case of sexual precocity in a girl of three years, who at autopsy showed no tumor whatever.

Sexual Backwardness—Ovarian Hypofunction.—In the presence of ovarian sarcoma, ovarian hyperfunction was found to occur most frequently before the age of fourteen; ovarian hypofunction, on the other hand, most frequently between fourteen and twenty. In our series, 16 of the 49 cases occurring after the age of fourteen showed manifestations of ovarian hypofunction in some form—32.6 per cent.

In no case reviewed was there so marked a picture of ovarian hypofunction as in the case herewith reported. This patient was sixteen years old, had never menstruated, and was markedly underdeveloped sexually, both externally and internally, as operation disclosed. In 5 other cases, amenorrhea had been a feature of the menstrual history. Amenorrhea had developed in 7 cases; there was delayed onset in 3 cases; in one, scanty. In one case, menstruation appeared as an established function some time after the removal of the sarcomatous ovary. In 2 cases where amenorrhea had developed preceding operation, the function returned some time afterward. In the case herewith reported, menstruation never occurred, but a year after operation a very slight growth of pubic hair was noted, where before the removal of the sarcomatous ovary it was barely noticeable. No menstrual history was mentioned in 25 of the cases reviewed; menorrhagia or metrorrhagia occurred in 7 cases; in 3 cases the function was apparently normal.

Novak[14] states that "the only type of anatomic alteration capable of inducing amenorrhea is one which involves a destruction or loss of function of all secreting ovarian tissue." He observed this more frequently with neoplasms than with inflammatory growths. Unquestionably, amenorrhea and failure of the secondary sexual characteristics to develop in some of these cases, as in the one reported herewith, may be explained by an underdeveloped and atrophic ovary of the other side, or by a concomitant tumor, as in the case of bilateral involvement. Unfortunately, many—in fact, the majority—of the cases recorded fail to mention the findings in the opposite ovary, or in the uterus.

Ovarian Tumors in General in Children, and Their Effect Upon Ovarian Function.—Ovarian hyper- and hypofunction may occur not only in connection with sarcoma, but with other malignant, and even benign growths of the ovary as mentioned before.

Kelly[23] stated "that menstrual disturbances do not necessarily accompany ovarian tumors, and that when irregularities are present they are in no way distinctive."

Wolff[24] concluded "that in children premature development is an indication of the development of tumors in the reproductive apparatus."

Croom[25] did not regard premature sexual development as a frequent association of tumors of the generative organs. He said: "It has been asserted that among the causes tending to produce changes in the sexual apparatus peculiar to puberty, we should include neoplasms affecting or relating to the genital organs. This would appear, however, to be far from the usual rule, and rather the exception; with a view to ascertaining the frequency of this occurrence, I have examined the records of the laparotomies performed on children, and in

only one case do there seem to have been signs so marked as to arrest the attention of the operator so far as to give a description of the child's appearance.'' This was in 1893.

Differences of opinion are evident. While it is apparent that no hard and fast line can be drawn as to altered ovarian function in relation to neoplasms, it is certainly more than a coincidence that such changes are an accomplished fact. Accordingly,[5] one is no doubt justified in regarding the tumor development in the ovary either in the nature of a stimulus to the secreting structure, when occurring before puberty, as is apparent in so marked a percentage of cases, or as a destructive influence when evidenced by the hypofunction occurring in a very decided percentage of the cases between fourteen and twenty years.

Symptomatology and Diagnosis.—The symptomatology is not an unusual one in onset, and is often not pronounced until the condition is well advanced. The average history is primarily that of a rapidly-growing, movable, pelvic or abdominal mass, or abdominal enlargement, perhaps more or less fixed, and generally discovered accidentally. In several cases blows are reported as preceding events, although this may have been the incident occasioning the revealing examination. Tenderness may or may not accompany. Other objective signs may be the development of secondary sexual characteristics, early in life, and disturbances of menstruation or precocious menstruation. Embarrassed respiration and cyanosis due to pressure may be noted.

Subjectively, pain has been present, but only when the tumor has attained a recognizable size, torsion of the pedicle or intestinal obstruction has occurred, or there is pressure upon adjacent viscera. As the condition progresses, listlessness, increased temperature, nausea, vomiting, diarrhea or constipation, and urinary disturbances may be present—in fact, any of the signs and symptoms referable to a pelvic or abdominal neoplasm, or dependent upon an accident to it. Emaciation, anemia, and evidence of metastatic involvement are terminal. Glandular enlargements rarely present peripherally.

The diagnosis has been made frequently. However, pregnancy has sometimes been considered; ovarian cyst, fibroid tumor of the uterus, hematometrium, hypernephroma, neoplasm of the kidney, and tuberculous peritonitis are among the provisional diagnoses that have been made.

It seems well to emphasize sexual precocity as a syndrome sufficiently often associated with ovarian sarcoma to warrant a thorough investigation as to the presence of a tumor when it is encountered. The presence of ovarian hypofunction, or sexual backwardness, likewise points to the consideration of ovarian neoplasm after puberty. It must be borne in mind also, that in a child the signs and symptoms

may frequently be upper abdominal because of the rapid ascent of a tumor springing from the pelvis, as Kelly pointed out.

Location and Varieties of Tumors.—In our collection of 119 cases, the location of the tumor was not mentioned in 27 instances. Forty-two sprang from the left ovary; 33 from the right; 17 were bilateral.

Forty-five were simply designated "sarcoma." The remainder were grouped as follows:

Round cell	20	Fusocellular	2
Small round cell	7	Alveolar	2
Myxosarcoma	8	Myxosarcoma and endothelioma	2
Cystosarcoma	8	Myxochondrosarcoma	1
Fibrosarcoma	5	Sarcomatous embryoma	2
Large round cell	4	Adenosarcoma, with areas of carcinoma	1
Spindle and round cell	3	Adenocarcinoma, with areas of sarcoma	1
Spindle cell	4		
Mixed cell	3		

Treatment and Results.—Ninety-four of the series, 79 per cent, came to operation. Eighteen cases were autopsied. Six cases were both operated upon and later autopsied. Twelve cases are indefinitely reported.

Surgical recovery took place in 69 cases—73.4 per cent. Death occurred at operation or shortly afterward in 20 cases—21.2 per cent. In 5 cases, the result is not definite.

The longest period of recovery to be stated is twenty years. Five are quoted as "later marrying." Cases are reported well at three and one-fourth, three, two and one-half, two, one and one-half, and one year. Deaths are reported as occurring in some cases anywhere from two months to a year later. In the majority of cases the period of recovery is not mentioned, as they were evidently lost sight of, or reported very soon after operation.

The treatment is early operation, and removal of the sarcomatous growth. The contraindications to operation are those of malignancy anywhere, viz., lymphatic and metastatic involvement, anemia, and emaciation.

REPORT OF CASE.*—The case occasioning our review of the literature is herewith submitted, and a presentation of the 118 cases collected is appended.

The patient, "R. D.", aged sixteen years, was American born of Italian parents, and was admitted to the Gynecological Ward of the Jefferson Hospital, February 6, 1922. The chief complaints were left-sided abdominal pain, of two weeks' duration, and a midline abdominal swelling, first noticed when the pain was investigated. The most important point in the family history was the fact that the patient had a twin sister, who, like herself had never menstruated, experienced any suggestive periodic pain, or exhibited any type of vicarious menstruation.

Her past history was uneventful, except that she had never progressed well in school, advancing only to the fourth grade. There were no cardiorespiratory, gastrointestinal, or urinary symptoms. The onset of the present illness was ap-

*I wish to thank Dr. Brooke M. Anspach, Chief of the Gynecologic Department, Jefferson Hospital, for the privilege of reporting this case.

parently of but two weeks' duration—at least, that was the period of time during which the left-sided abdominal pain, and the abdominal mass had been known to exist.

Examination showed an under-sized young girl, below par mentally; adenoid facies; eyes set far apart; large lobed ears, accompanied by a partial deafness, existent from birth. The palate was high-arched, the teeth irregular and misshapen. The tonsils had been removed. The neck was thick-set, the thyroid gland not palpable. The chest was rachitic in type, with the mammary glands underdeveloped in appearance. The heart and lungs were negative. No axillary hair was present, and very few pubic hairs could be seen. There was a congenital deformity of both elbow joints, that interfered to some extent with free mobility, supination and pronation.

A symmetrically enlarged tumor was palpable in the midline of the abdomen, with a projecting tongue reaching almost to the left iliac crest, and extending more than half-way to the umbilicus. The mass was readily rotated, not tender or objectively painful, and was flat on percussion. Auscultation was negative; there was no ascites. The external genitalia were considerably smaller than one would expect in a girl of sixteen, but were apparently normally formed. Few pubic hairs could be seen. No vaginal examination was made at this time, but rectally the mass could be felt anterior to the rectum. It was apparently a part of the uterus, or attached to it, irregularly filling Douglas' pouch, and rising as high as the umbilicus. It was semifluctuating, resilient, and more or less "Y" shaped.

Urinalysis was negative; moderate secondary anemia, no leucocytosis; Wassermann negative; total phthalein, 35 per cent. The chest x-ray was negative except for moderate spinal curvature.

No definite diagnosis was made, but sarcoma was not mentioned. Myoma uteri, hematometrium with bicornate formation of the uterus and gynatresia, ovarian cyst, and renal neoplasm were considered possible in the order named, and exploratory section was decided upon.

Under ether anesthesia, a vaginal examination was first made. This showed the mass to be definitely apart from the uterus, the cervix admitting a small probe with considerable difficulty.

Abdominal section, Dr. Anspach, showed a large, reddish-white, kidney-shaped, soft tumor, presenting transversely as a tumor of the left ovary, having a twisted pedicle, and attached to omentum and mesentery. The uterus was infantile, 4 cm. long x 2 cm. wide x 1 cm. in thickness. The Fallopian tubes were elongated and infantile, the fimbriated extremities above the pelvic brims. The right ovary was elongated and atrophic. There was no evidence of abdominal metastasis. "Gas appendix," with fecal concretions. Left oophorectomy and appendicectomy were performed, adhesions separated, all bleeding points ligated, and raw surfaces peritonealized. The abdomen was closed without drainage, and the patient returned to the ward in good condition.

The patient made a good surgical recovery, leaving the hospital in twenty-eight days, convalescence being prolonged by a superficial wound infection, due to her interference with the dressings. For a short time, she was regularly observed in the Out-patient Department, but being rather uncooperative, failed to appear for some time. During the summer of 1923, she was found to be regularly employed, and she agreed to an examination. Menstruation had not occurred, there was a perceptible growth of pubic hair, but none in the axilla. The general health was apparently good, and no signs of recurrence were present. The twin sister was seen at the same time, with similar findings as to secondary sexual char-

acteristics, but nothing suggestive of a tumor. Because of the patient's failure to cooperate, glandular therapy has been rather spasmodically employed.

Histologically, the tumor was diagnosed as a large round-cell sarcoma of the ovary, quite possibly of a congenital type (Dr. B. L. Crawford).

CONCLUSIONS

1. The frequency of sarcoma of the ovary in general is a trifle less than 4 per cent; that of sarcoma of the ovary in children varies from 18 to 25 per cent of all ovarian neoplasms. Hence it is relatively more frequent in children and young girls than in adults.

2. The age incidence of ovarian sarcoma varies from 6.2 to 19.8 per cent below the age of twenty years. An average, 14.3 per cent, occurs before the age of twenty years. The most frequent decade of life, in which it occurs, is between twenty-one and thirty years. In all cases collected up to and including twenty years of age, the greatest number, 13, were aged eighteen; 12 were aged thirteen; 10 were aged nineteen.

3. Seventy cases, 58.8 per cent, occurred at or before the age of puberty taken as fourteen years. Of these, 17, or 24.3 per cent manifested sexual precocity in one way or another. Forty-nine cases, or 41.1 per cent, occurred after fourteen years of age, and up to and including the age of twenty, with no history of precocity. Of these, 16 cases, or 32.6 per cent showed hypoovarian function—sexual backwardness—to some extent. Hence hyperovarian function is associated with ovarian sarcoma at or before puberty in an appreciable percentage of cases, while hypoovarian function is similarly associated with those cases occurring between puberty and twenty years.

4. The principal objective symptom is a rapidly-growing, freely movable (sometimes fixed) abdominal or pelvic tumor. Menstrual disturbances are frequent, and there may be pronounced evidence of hyperovarian, or hypoovarian function, the former more marked before, the latter more marked after puberty. Pain and gastrointestinal symptoms are manifested later, and are those of any ovarian tumor increasing in size or meeting with an accident. Concomitant signs of malignancy are later manifestations.

5. Bilateral ovarian sarcoma are much less frequent than unilateral. In 27 of the cases no site was recorded; 42 were on the left side; 33 involved the right adnexa; 17 were bilateral.

6. Round-cell sarcoma was the most common type.

7. The diagnosis, dependent upon a careful history and examination, requires immediate operation—no contraindications obtaining. The earlier the interference, the more favorable the prognosis.

8. In the series collected, 94 cases—79 per cent—came to operation.

Of these, 69—73.4 per cent—were surgical recoveries, death occurring in 20—21.2 per cent. The percentage of ultimate recoveries cannot be given with accuracy.

CASE REPORTS FROM THE LITERATURE

1. Doran (Trans. Path. Soc., London, 1889, xl, 200.) Seven months; bilateral, round cell (?); discovered at autopsy, as child lived but a few minutes after birth.

2. Lesage and Girault (Archiv. de Med. de Enf., 1913, xvi). One year right side, round cell found at autopsy.

3. Polano (Arch. f. Gynäk., Oct. 1, 1923, cxx, 308). One and one-half years right side, myxosarcoma, death following operation. Menstruation present, also well-developed labia, protruding nipples, pubic and axillary hair.

4. Flatau (Münch. med. Wchnschr., 1903, i, 532). One year and three-quarters; tumor removed at operation; location and type not specified, and result not given.

5. Harris (Am. Jour. Obst., 1904, i, 530). One and five-sixth years; mixed cell sarcoma and endothelioma, site not mentioned; twisted pedicle; operation with recovery.

6. Hayd (Am. Jour. Obst., 1918, lxxviii). One year and eleven months; left, small round cell; operation, with death in five weeks from general sarcomatosis.

7. Matthews (Northwest. Med., 1916, p. 372). Two years; right, type not mentioned; operation and recovery.

8. Kussmaul (Würzburg. Med. Zeitschr., 1862, iii, 321). One year and seven months; right, spindle-cell, removed at autopsy. Menstruation present, breasts and external genitalia developed; uterus that of puberty, but left ovary not fully developed.

9. Evers (St. Louis Courier Med., 1884, xii, 130). Two and a half years; right, type not mentioned, found at autopsy.

10. Gibb (Glasgow Med. Jour., lx, 33). Two and a half years; myxochondrosarcoma, location not mentioned; operation and recovery.

11. Hoffman (Am. Jour. Obst., 1897, xxxvi, 331). Two and three-fourths years, left, cystosarcoma, periodic vaginal discharge, breasts and external genitalia well-developed, uterus enlarged. Operation and death in 33 hours.

12. Johanssen (Nord. med. Ark., 1 Afd. 1N:RR, p. 5). Three years; bilat., small round-cell, operation and recovery.

13. Roxburgh (Glasgow Med. Jour., 1889, lii, 396). Three years; right cystosarcoma, thin vaginal discharge, breasts and external genitalia developed; operation and death; autopsy.

14. Savariaud (Bull. et mém. Soc. de chir. de Paris, 1911, xxxvii, 639). Three years, fusocellular, site not mentioned, breasts developed and pubic hair present. Operation and recovery. Precocity disappeared within a year.

15. Smith and Motley (Surg. Gyn. and Obst., 1915, xx, 419). Three years, bilat., "sarcomatous embryoma," operation and recovery, with recurrence later. Infantile uterus.

16. Cameron (Glasgow Med. Jour., 1889, xxxi, 37). Three and a half years, round cell, site not mentioned, vaginal discharge, breasts and pubic hair developed, linea nigra present. Operation and death; autopsy.

17. Bevern (Jour. der Pract. Arz. u. Wundarz, Berlin, 1802, xiv, 141). Three and a half years, bilat., development of breasts and pubic hair, enlarged uterus. Was a twin, and large in stature. Autopsy.

18. Jochmann (Dissert. Freiberg, 1898). Four years, right, round cell, seen at autopsy; metastases present.

19. Marchland (Berl. klin. Wchnschr., 1894, xxxi, No. 2). Four years, right, small round cell, operation and death.

20. Roxburgh (ref. No. 13 preceding). Four years, site and type not mentioned; operation and death; metastases.

21. Byford (Chicago Med. Recorder, 1891-2, ii, 434). Four and two-thirds years, site and type not mentioned; bloody vaginal discharge, enlarged breasts, and pubic hair. Operation and recovery. Twisted pedicle.

22. Foerster (Am. Jour. Obst., 1895, xxxi, 80). Four and a half years, left sm. round cell. Operation and death in 6 weeks; with autopsy, showing sarcomatosis.

23. Higgins (Brit. Jour. Child. Dis., 1915, xii, No. 138, 161). Five years, left, mixed spindle and round cell; bloody vaginal discharge and enlarged uterus. Operation and recovery.

24. Viering (Dissert. Greifswald, 1891, 5). Right, fusiform sarcoma; seen at autopsy.

25. Wiel (Johns Hopkins Hosp. Bull., 1905, 15 and 16, No. 168, 102). Five years, left, adenocarc., with some areas of sarcoma; bloody vaginal discharge, enlarged breasts and uterus, and pubic hair. Operation and recovery.

26. Wilkinson (Kansas Med. Jour., 1915, 373). Five years, bilat., sm. round cell; operation and death 2 mos. later.

27. Cohn (Zeit. f. Geb. u. Gyn., 1886, 27). Six years, seen at operation. No case record.

28. Page (Lancet., Dec. 7, 1895). Six years; fibrosarcoma, site not mentioned; operation and recovery.

29. Riedl (Wien. klin. Wchnschr., 1904, No. 35, p. 942). Six years; left medullary round cell, menstruation, enlarged breasts, pubic hair; enlarged uterus, cystic right ovary. Operation. Result not mentioned.

30. Turner (Trans. Path. Soc., Lond., 1893, xliv, 110). Six years; bilat., medullary sarcoma; discovered at autopsy; had been diagnosed tuberculous peritonitis.

31. Verebely (Wien. klin. Wchnschr., 1912, No. 13, p. 501). Six years; left, type not mentioned; menstruation, enlarged breasts and uterus; deep voice. Operation and recovery. Precocity disappeared after operation.

32. Croom (Edinburgh Med. Jour., 1893, xxxviii, 689). Seven years; left, round cell; vaginal bleeding, enlarged breasts and uterus, pubic hair, linea nigra, but right adnexa underdeveloped. Operation and recovery. Precocity disappeared.

33. Higgins (ref. No. 23 preceding). Seven years; right, round cell; seen at autopsy.

34. Meredith (Lancet, May 5, 1888). Seven years; site and type not mentioned. Operation. No case record.

35. Lucas (Trans. Clin. Soc., Lond., 1888, xxi, 224). Seven years; right, round cell; vaginal bleeding, enlarged breasts, pubic hair. Operation and recovery. Precocity disappeared.

36. Winkel (ref. No. 39 following). Seven years; site and type not mentioned. No case record. Operation or autopsy? (Quoted by Leopold.)

37. Cameron (Lancet, Mar. 14, 1896). Eight years; site and type not mentioned; operation and death; metastases.

38. Stolypinski (J. Akush. i Jensk. Boliez., St. Petersberg, 1890, iv). Eight years; type not mentioned, left side. Operation or autospy? Original reference not seen.

39. Leopold (Arch. f. Gynäk., 1874, vi, 202). Eight years; left, cystic sarcoma (or endothelioma); seen at autopsy.

40. Outerbridge (Trans. Path. Soc., Phila., Apr. 13, 1922) and Siegel (Samaritan Hosp. Clin. Soc., Phila., Mar., 1922), personal communication. Eight years; right, cystic sarcoma; enlarged breasts and external genitalia; pubic and labial hair. Operation, with recurrence and death in two months, autopsy, showing general sarcomatosis.

41. Forbes (Austral. Med. Jour., 1894, 397). Nine years; myxosarcoma, site not mentioned. Operation and recovery.

42. Malins (Lancet, May 31, 1890, 1174). Nine years; right, cystic sarcoma; irregular vaginal bleeding; operation and recovery.

43. Higgins (ref. No. 23 preceding). Ten years; right, mixed round and spindle cell; uterus normal. Operation and recovery.

44. Kayser (Monatschr. f. Geburtsh. u. Gynäk., 1906, xxiii). Ten years; left, myxoendotheliosarcoma. Operation and recovery.

45. McBurney (Ann. of Surg., 1895, xxi, 706). Ten years; left, round cell. Operation and recovery. Preoperative diagnosis, sarcoma of right kidney.

46. Wagner (Arch. f. klin. Chir., 1884, xxx, 504). Ten years; left, round cell. Operation and recovery.

47. Croom (Trans. Edinburgh Obst. Soc., 1880, xiv, 90). Eleven years; bilateral, type not mentioned. Operation and recovery.

48. Kluge (Dissert. Marburg, 1894). Eleven years; left, myxosarcoma. Operation and death.

49. Napier (Glasgow med. Jour., 1899, li, 207). Eleven years; left, large round cell. Operation and death.

50. Pawlik-Lenz (Arch. f. Gyn., 1913, xcix, 138). Eleven years; right, cystosarcoma; menstruation for past six years, enlarged breasts and pubic hair. Operation and recovery.

51. Kelly (Keating's Cycloped. Dis. Child., 1899, v). Twelve years; left, type not mentioned. Operation and recovery, with death two years later from dysentery.

52. Schlossark (Wien. Med. Press., 1894, No. 43). Twelve years; left, type not mentioned. Operation or autopsy? No case record.

53. Stauder (Ztschr. f. Geburtsh. u. Gynäk., 1902, xlvii, 24). Twelve years; left, round cell; uterus small, r. ovary fetal. Operation and recovery.

54. Bode (Zentralbl. f. Gynäk., 1894, xviii, No. 46, 1172). Thirteen years; right, round cell. Operation and recovery.

55. Bazy (Bull. et mém. Soc. d. chir. d. Paris, xxxvii, 1911, p. 664). Thirteen years; right, myxosarcoma. Operation and recovery. Later married.

56. Donhauser (Albany Med. Ann., xxvii, 20). Thirteen years; right, adenosarcoma with areas of adenocarcinoma. One menstrual period. Operated upon twice, with death one month after the second. Autopsy showed sarcomatosis.

57. Eckhardt (Deutsch. med. Wchnschr., 1895, xiv, 96). Thirteen years; left round cell. Operation and recovery.

58. Flaischler (Ztschr. f. Geburtsh. u. Gynäk., 1882, vii, 473). Thirteen years; right, type not mentioned. Operation or autopsy? No case record.

59. Heinrichs (Handb. d. Krankh. d. Weiblich. Adnexorg. [A. Martin], 1899, ii). Thirteen years; bilat., round cell; operation and recovery.

60. Jacobson (Zentralbl. f. Gynäk., 1889, xiii, 243). Thirteen years; mixed cell; site not mentioned. Operation with death in eight weeks.

61. Wagner (ref. No. 46 preceding). Thirteen years; left, round cell. Operation and death.

62. Cohn (ref. No. 27 preceding). Thirteen years; type and site not mentioned. Operation or autopsy? No case record.

63. Brown (*Ovarian Dropsy*, Lond. 261). Thirteen years; left, type not mentioned. Had never menstruated. Operation and death.

64. Erdmann (Ann. of Surg., 1908, xlviii, 619). Thirteen and a half years; left, "sarcoma with much embryonal tissue." Operation with recovery, but metastases one year later from the scar. Final result not stated.

65. Hecht (Dissert. Halle, 1895). Fourteen years; right, fibrosarcoma. Operation and recovery.

66. Muratoff (Eshenedelink, 1895, No. 15, cited by Hubert, Dissert. Giessen, 1901). Fourteen years; no case record. Unable to obtain original reference.

67. Shewman (Nat. Eclect. Med. Ass. Quart., 1920, xii, 471). Fourteen years; left, type not mentioned. Operation, showing peritoneal growths present. Final result not stated.

68. Smith, H. (Lancet, Aug. 22, 1874). Fourteen years; bilat., type not stated; operation and death. Autopsy. Had been thought before operation to be pregnant.

69. Vonnegut (Dissert. München, 1896, cited by Hubert, Dissert. Giessen, 1901). Fourteen years; bilat., alveolar sarcoma; seen at autopsy. No case record; original reference not obtained.

70. Spencer, Wells (*Ovarian and Uterine Tumors*, 1882, 55). Thirteen and three quarter years; bilat., "encephaloid sarcoma," (Bland-Sutton); seen at autopsy, showing malignancy in uterus and bladder also.

71. Coignerai (Thèse de Paris, 1902, 73). Fourteen and a half years; left, myxosarcoma. Had never menstruated; operation with recovery, organs normal. The preoperative diagnosis had been hematometrium.

72. Gross (Prag. med. Wchnschr., 1912, xxxvii, 79). Fourteen and a half years; left, spindle cell; amenorrhea for three months preceding. Operation and recovery, with subsequent return of menstruation.

73. Mond (cited by Klauhammer, Dissert. Jena, 1912). No case record; original reference not obtained; Fifteen years.

74. Kratzenstein (Ztschr. f. Geburtsh. u. Gynäk., 1897, xxxvi, 61). Fifteen years; right, type not mentioned. Operation and death.

75. Porter (Tr. West. Surg. Ass., 1913). Fifteen years; bilat., large round cell; had never menstruated; operation and recovery.

76. Wolf (Arch. f. Gynäk., 1910, xcii, 721). Fifteen years; left, round cell; menstruation had been established for three months. Operation and recovery.

77. Outerbridge (Tr. Path. Soc. Phila., Apr. 13, 1922). Fifteen years; left, large round cell; amenorrhea for three months preceding operation. Recovery.

78. Gage (Jour. Am. Med. Assn., Dec. 8, 1894, p. 856). Fifteen and a half years; right, alveolar sarcoma; operation and recovery. Uterus not fully developed, and left ovary cystic.

79. Wolf (ref. No. 76 preceding). Sixteen years; right, type not mentioned; menstruation irregular. Operation and recovery; later married.

80. Baldy (Am. Jour. Obst., 1898, xxxvii). Sixteen years; site and type not mentioned. Operation and death.

81. Doran (*Tumors of Ovary, Fallopian Tube, and Broad Ligament*). Sixteen years; site and type not mentioned; had never menstruated. Operation and recovery.

82. Judd (AM. JOUR. OBST. AND GYN., 1920-1, 383). Sixteen years; left, type not mentioned; menstruation began at eleven years. Operation and recovery; twisted pedicle.

83. Pick (Zentralbl. f. Gynäk., No. 39, 1894, p. 940). Sixteen years; left, round cell; had never menstruated; also developed "choked disc." Operation and recovery, with development of menstruation several months later.

84. Hecht (ref. No. 65 preceding). Seventeen years; right, myxosarcoma; operation with recurrence in three months.

85. Kratzenstein (ref. No. 74 preceding). Seventeen years; left, large round cell; operation and recovery.

86. Omori and Ikeda (Zentralbl. f. Gynäk., No. 52, 1892, p. 1009). Seventeen years; left, type not mentioned; operation and recovery.

87. Stauder (ref. No. 53 preceding). Seventeen years; left, round cell; vaginal bleeding for eight weeks preceding operation; recovery.

88. Wenning (Am. Jour. Obst., 1888, xxi, 1214). Seventeen years; bilat., type not mentioned; no menstrual disturbance. Operation and death. Preoperative diagnosis of pregnancy had been made.

89. Brodhead (Med. Rec., New York, April, 1916, p. 650). Eighteen years; right, spindle cell; operation and recovery; had complicated the puerperium.

90. Heinrichs (ref. No. 59 preceding). Eighteen years; left, type not mentioned; operation and recovery.

91. Heinrichs (ref. No. 59 preceding). Eighteen years; left, type not mentioned; operation and death. Metastases were present.

92. Vineberg (ref. No. 82 preceding, discussion). Eighteen years; right, myxosarcoma; operation and recovery. Later married.

93. Kratzenstein (ref. No. 74 preceding). Eighteen years; bilat., type not mentioned; amenorrhea for eight months preceding operation. Recovered but died of metastasis in six months.

94. Landau, (Zent. f. Gyn., 1893, xvii, 1124). Eighteen years; left, fibrosarcoma; no case record. Operation or autopsy?

95. Leopold (Deutsch. Med. Wchnschr., 1887, xiii). Eighteen years; right, type not mentioned; had never menstruated; operation and recovery (three and one-fourth years later was alive).

96. Pick (ref. No. 83 preceding). Eighteen years; left, spindle cell; menstruation had begun at fourteen, with amenorrhea for one and one-half years preceding operation. Recovery, with return of menstrual function.

97. Porter (ref. No. 75 preceding). Eighteen years; left, round cell; menorrhagia. Operation and recovery; living twenty years later.

98. Haines (ref. No. 75 preceding, discussion). Seventeen years; right, amenorrhea. Operation with recovery, but death in two years from metastasis.

99. Rawls (Va. Med. Semi-month., Apr. 8, 1910). Eighteen years; bilat., small round cell. Operation and death.

100. Stauder (ref. No. 53 preceding). Eighteen years; left, round cell; irregular menstruation; operation and recovery.

101. Wilks (Trans. Path. Soc. Lond., x, 146). Eighteen years; bilat., type not mentioned; autopsy.

102. Viering (ref. No. 24 preceding). Eighteen years; no case record.

103. Kratzenstein (ref. No. 74 preceding). Nineteen years; right, cystosarcoma; menorrhagia; operation and recovery.

104. Kratzenstein (ref. No. 74 preceding). Nineteen years; right, type not mentioned; operation and recovery. Later married.

105. Olshausen (*Diseases of the Ovaries* in Cyclopedia of Obstetrics and Gynecology). Nineteen years; myxosarcoma, site not mentioned; operation and death.

106. Polak (New York Acad. Med., Sec. Obst. and Gynec., Dec. 22, 1914). Nineteen years; bilat., round cell. Operation and death; metastasis present.

107. Stauder (ref. No. 53 preceding). Nineteen years; left, mixed cell; operation and recovery.

108. Freund (Ztschr. f. Geburtsh. u. Gynäk., xvii). Nineteen years; right, polycystic with sarcomatous papillae; menorrhagia. Operation and recovery. Later married.

109-10-11. (3 cases) Cohn (ref. No. 27 preceding). No case records, but each case was 19 years.

112. Winckel (ref. No. 95 preceding). Nineteen and three-quarter years; right, spindle and round cell; menstruation began at sixteen; amenorrhea for two years prior to operation. Death from pulmonary embolism.

113. Davis (West. Med. Rev., Aug. 15, 1896, p. 82). Twenty years; left, fibrosarcoma; metrorrhagia; operation and recovery.

114. Keith (Brit. Med. Jour. Jour., Oct. 19, 1878). Twenty years; site and type not mentioned; operation and recovery. No case record.

115. Leopold (ref. No. 95 preceding). Site and type not mentioned, operation and recovery. No case record.

116. Mallet (Med. Rec., New York, 1894, xlv, 237). Twenty years; small round cell, site not mentioned. Scanty menstruation; operation and recovery.

117. Olshausen (ref. No. 105 preceding). Twenty years; left; operation, result not stated. No case record.

118. Stauder (ref. No. 53 preceding). Left mixed cell; menstruation established at seventeen; operation and recovery.

REFERENCES

[1]Pfannenstiel: Die Erkrankungen des Eierstockes und des Nebeneierstockes, Veit's Handbuch der Gynäkologie, Wiesbaden, 1908, iv.

[2]Stauder: Ztschr. f. Geburts. u. Gynäk., 1902, xlvii, 357.

[3]Lippert: Arch. f. Gynäk., lxxiv, 389.

[4]Olshausen: Diseases of the Ovaries, in Cyclopedia of Obstetrics and Gynecology, Trans. by E. H. Grundin.

[5]Jungmann: quoted by Pfannenstiel.[1]

[6]Hubert: Ueber Ovarialgeschwulste bei Kinderheit, Dissert., Giessen, 1901.

[7]Heinrichs: Handbuch der Krankheiten der Weiblichen Adnexorgane, Vol. II, 1899 (A. Martin).

[8]Hoon: Penn. Med. Jour., October, 1922.

[9]Bland-Sutton: Surgical Diseases of the Ovaries and Fallopian Tubes, 1891.

[10]Wiel: Bull. Johns Hopkins Hosp., March, 1905, No. 168.

[11]Temesvary: Verhandlung der Deutsch. Gesellsch. f. Gynäk., 1895, vi, 746.

[12]Baccus: Trans. Chic. Path. Soc., 1901-2, 128-34.

[13]Viering: Ein Ovarialsarkom bei einem Kinde, Dissert., Greifswald, 1891.

[14]Novak: Menstruation and its Disorders, Gynec. and Obst. Monographs, 1923, Appleton, N. Y.

[15]Brohl: Zentralbl. f. Gynäk., 1897, xxi, 113.

[16]Sacchi: quoted by Novak.[14]

[17]Harris: Surg., Gynec., and Obst., 1917, xxiv, 604.

[18]Lenz: Arch. f. Gynäk., 1913, xcix, 67.

[19]Hofacker: Zentralbl. f. Gynäk., 1898, xxii, 1120.

[20]Bulloch and Sequira: Trans. Path. Soc. of London, 1905, lvi, 189.

[21]Newmann: Monats. f. Psychiat., 1901, lx, 337.

[22]Prochownik: Arch. f. Gynäk., xvii, 330.

[23]Kelly: (Keating), 1899, v.

[24]Wolff: Arch. f. Gynäk., 1910, xcii, 721.

[25]Croom: Premature Sexual Development, etc., Edin. Med. Jour., 1893, xxxviii, 689.

(*For discussion, see p.* 561.)

SUPRAPUBIC SPHINCTER TIGHTENING*

By H. Dawson Furniss, M.D., F.A.C.S., New York

SINCE Kelly in 1913 described his operation of enfolding the vesical sphincter by the vaginal route for vesical incontinence, I have used it in properly selected cases with the utmost satisfaction. In some instances the operations were difficult, and in these the results were not perfect. This set me thinking that there might be an easier

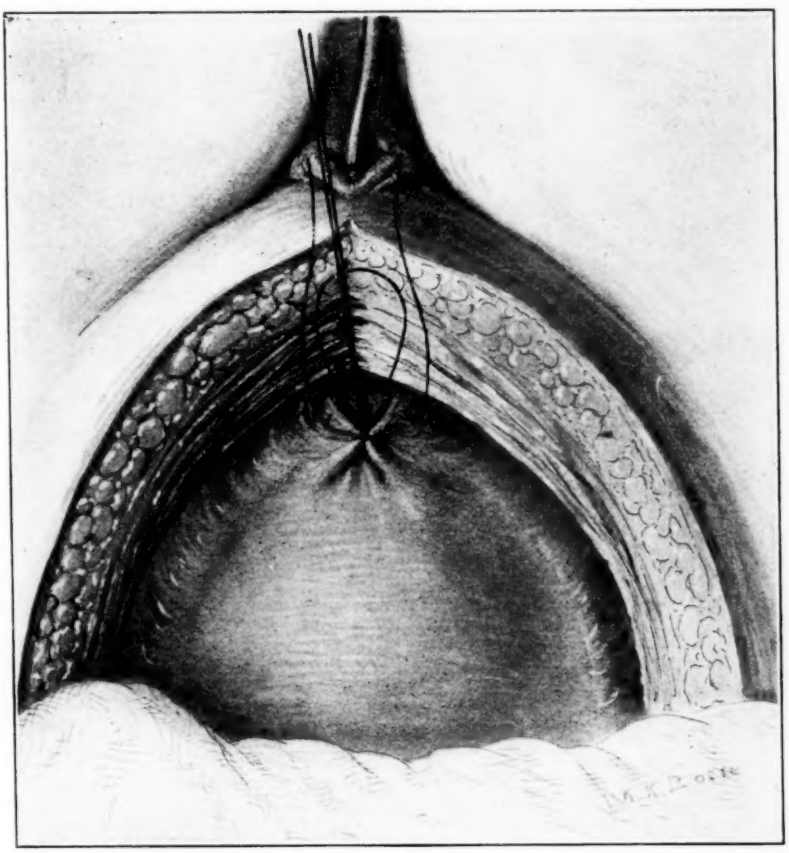


Fig. 1.—First suture placed just anterior to the flared portion of a Pezzer catheter that has been drawn taut against the internal urethral orifice. This may be placed as a single or as a mattress suture.

and more satisfactory operation for the cases unsuited for the Kelly method.

In operations where I opened the bladder suprapubically, I was

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Ohio, September 18 to 20, 1924.

impressed by the fact that the sphincter was easily accessible, and that it might be narrowed from above just as easily as from below. I did not carry this into effect until after F. C. Holden told me he had operated upon one such case satisfactorily. In this instance he enfolded the sphincter with catgut and packed gauze down to it with the idea of producing a large amount of scar tissue. Holden got his idea from Todd of Texas. In a search of the literature to June, 1924, I have been unable to find any reference to an operation

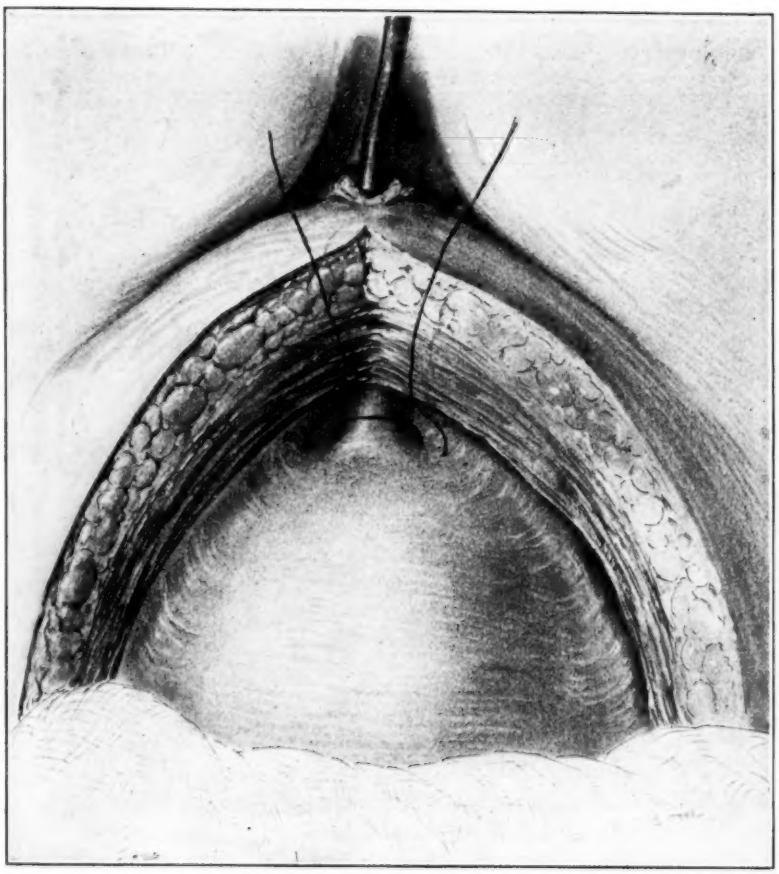


Fig. 2.—First suture has been tied. This puckers the tissues so that two folds in front and two behind it are made prominent and facilitates the introduction of the second suture. At times a third is placed in front of the second. If the relaxation is great a second tier of two or three is placed over the first row.

similar to the one I am about to describe. The only one bearing any resemblance to it is that of Fritsch, who through a suprapubic incision exposed the urethra, excised a longitudinal strip down to the mucosa and narrowed the urethra by bringing the edges together.

The operation as I do it consists in narrowing the urethra and the vesical sphincter through a median, extraperitoneal, suprapubic incision, extending from the symphysis to just below the umbilicus.

After incising the fascia the exposure of the sphincter is made by blunt finger dissection. High Trendelenburg posture makes this much easier. A Pezzer catheter placed in the bladder and withdrawn until the flared portion comes against the sphincter, is a necessary guide to the vesical outlet. This portion of the catheter is easily felt from above. With a rounded needle armed with No. 2, 20-day catgut, a suture is passed through a portion of the sphincter just in front of the flared portion of the catheter and one-third of an inch lateral to the median line, picking up one-quarter of an inch of tissue. Entering laterally and emerging medially on the opposite side, the same

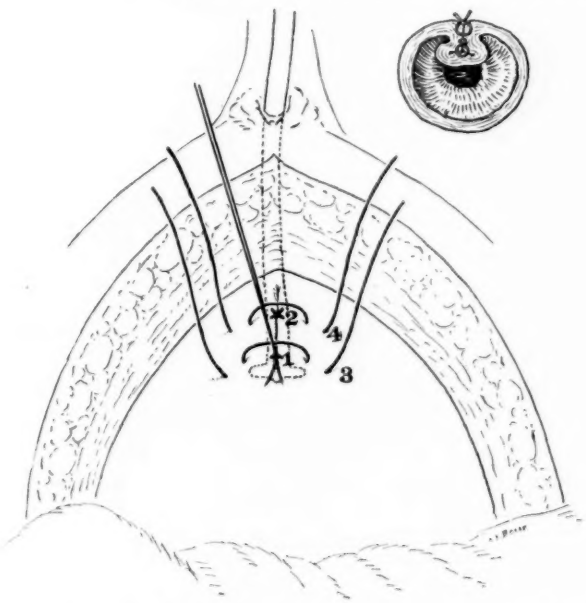


Fig. 3.—Diagram showing placement of sutures. The first and second sutures have been tied as shown by *1* and *2x*; *3* and *4* represent two sutures of the second tier. The insert shows diagrammatically the infolding of the urethra.

suture is similarly placed except that it enters medially and emerges laterally. This is then tied. A second suture is placed in the same manner three-eighths of an inch forward to this. If the relaxation is great a second tier of two sutures is placed to produce an even greater narrowing of the urethra.

In instances of prolapse of the urethra the caudad sutures of the second tier are left long and attached to the fascia of the abdominal wound so that the vesical end of the urethra is drawn up and behind the symphysis. Usually there is no bleeding—occasionally a vein overlying the urethrovesical junction may be punctured. Unless there is oozing, the abdominal wound is closed without drainage, the catheter removed, and the patient put in half Fowler position to give intestinal pressure to the operative area and prevent dead spaces.

In the after-treatment, catheterization is done as often and as long as indicated, the patient being given urotropin and acid sodium phosphate in the meanwhile. Patients are kept in bed twelve days. The chief point to be emphasized is the avoidance of straining efforts. I have had two perfect results of the classical Kelly slightly marred by coughing incident to influenza, therefore, with the development of such a condition the cough must be controlled by sedatives.

I do not believe the results of this operation are any better than of the Kelly, with the disadvantage of necessitating an abdominal incision. Therefore, I have restricted its use to (1) cases in which the Kelly is difficult of performance, as in elderly nulliparae and those with senile atrophy. In these the vagina is often very contracted, and

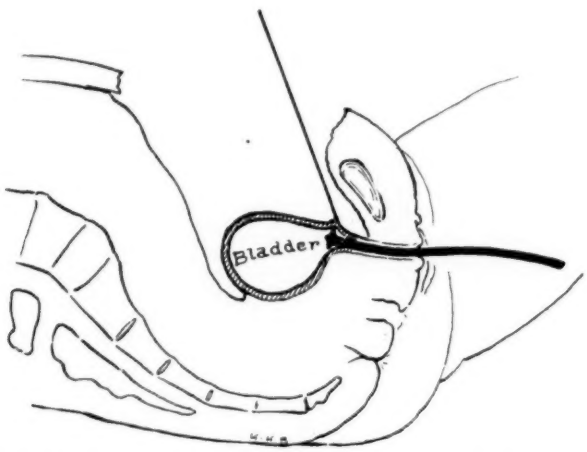


Fig. 4.—Sagittal section. Where there has been marked separation and prolapse of the urethra, the uppermost suture is left long and attached to the rectus fascia, thus elevating the urethra behind the symphysis.

the mucosa so thin and easily torn that dissection is most difficult; (2) where other operations have produced conditions making the Kelly technically difficult, as Watkins interposition, cystocele, and plastics for vesicovaginal fistulae when a previous Kelly operation has failed.

In abdominal operations done through a low median incision this operation may be advantageously added.

Since March I have done this operation on four cases with results that are for the moment good and which appear promising for the future.

54 EAST SIXTY-SECOND STREET.

(*For discussion, see p.* 560.)

PROLAPSE OF THE CULDESAC OF DOUGLAS OR POSTERIOR VAGINAL ENTEROCELE*

By Louis E. Phaneuf, M.D., F.A.C.S., Boston, Mass.

(Associate Professor of Clinical Gynecology, Tufts College Medical School. Gynecologist and Obstetrician, Carney Hospital.)

PROLAPSE of the culdesac of Douglas or posterior vaginal enterocele has received but little attention in the literature. The lack of recognition of this condition may be responsible, in part at least, for the poorer surgical results obtained in operations on the posterior vaginal segment, as compared with those of the anterior segment. The lesion is of importance for two reasons: the first, because it, not infrequently, accompanies uterine prolapse following childbirth and the second, because it stands out as the causative factor in the prolapse of virgins. The prolapse of the pouch of Douglas after childbirth is due to the fact that the normally thin but firm rectovaginal fascia is torn or overstretched during labor, especially during operative deliveries, allowing the formation of a hernial sac into which protrude small and large intestine, or omentum, or all three. In severe cases this hernia appears at the introitus or even in the outside world. In the nulliparous woman, where no other cause for prolapse exists, an abnormally deep culdesac, a congenital defect, with intraabdominal pressure directed against it, may cause so much traction on the posterior surface of the cervix and on the anterior wall of the rectum, that the so-called nulliparous prolapse may result.

In operating for rectocele, as part of an operation for procidentia, the overlooking of a posterior enterocele is frequently the cause of a recurrence in the posterior segment, while the bladder and uterus usually remain in good position.

There are two accepted methods of treating this condition surgically; the first consists of employing the vaginal route, as well described by Ward and the second, the procedure of Marion and Moscheowitz through the abdominal route.

I believe that the vaginal route is the avenue of choice in approaching the uncomplicated hernia; while the abdominal method is best reserved for the extreme types of enterocele, and those in which the presence of adhesions would make the vaginal work tedious and difficult.

The vaginal operation consists of opening the pelvic floor, up to the cervix, by a median incision; the enterocele will then be seen

*Read at the Thirty-seventh Annual Meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Ohio, September 18 to 20, 1924.

bulging over the rectocele. The former is dissected bluntly as far as the level of the sacrouterine ligaments anteriorally and laterally, and as far as the anterior rectal wall posteriorly. The sac thus exposed is picked up by forceps, opened and its contents reduced. If the sac is long, it is clamped at its base, resected, and closed by a running stitch of chromic gut: if it is broad and flat and does not come up readily, the excess of tissue is cut away and the edges are united by a catgut suture. In either case, the sacrouterine ligaments are approximated in front of the obliterated pouch and the perineum is repaired.

The abdominal operation consists in obliterating the culdesac by

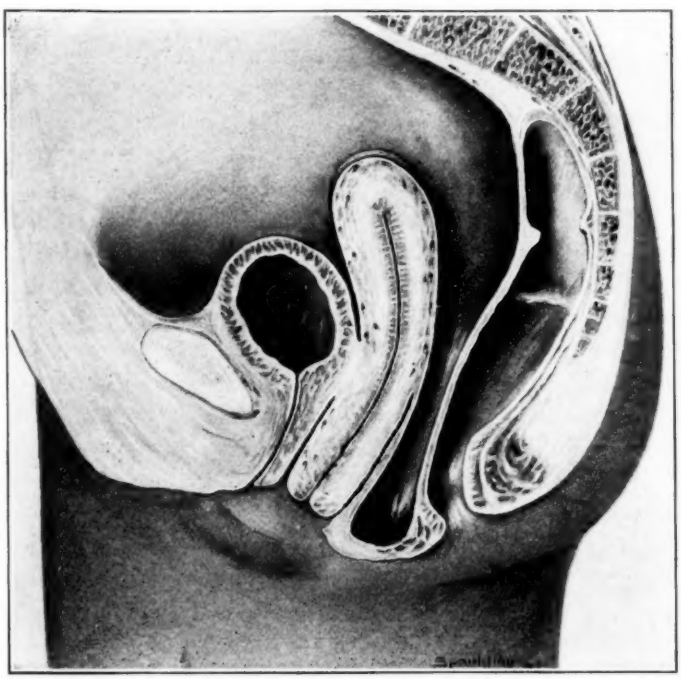


Fig. 1.—Enterocele (posterior vaginal hernia). Sagittal section of the pelvis to illustrate the prolapse of the culdesac of Douglas. The pouch filled with omentum or intestine usually accompanies uterine prolapse.

means of linen or chromic gut purse-string sutures placed in superimposed layers, starting at the bottom of the pouch and terminating at the level of the insertion of the sacrouterine ligaments. The only danger in connection with either method is the inclusion of the ureters in the sutures, for this reason, therefore, these structures should be identified before the placing of the stitches.

Sir Astley Cooper, in 1804, illustrated a case of posterior enterocele in his work on hernia. Fordyce Baker and T. Gaillard Thomas also have reported cases. Marion,[13] in 1909 proposed an operation, which consists of the obliteration of the culdesac of Douglas by the abdominal route. This operation he stated

was devised for certain forms of prolapsus where the perineum was solid, but where the abnormally deep culdesac of Douglas favored the prolapse of the vaginal wall, as well as the descent of the uterus and its retroflexion. He described his method of obliterating the culdesac by using purse-string sutures one above the other starting at the bottom of the pouch and terminating at the level of the insertion of the sacrouterine ligaments.

Moschcowitz[11] three years later, (1912) described a similar operation in a paper entitled *The Pathogenesis, Anatomy, and Cure of Prolapse of the Rectum.* He advised the correction of this condition by the obliteration of the culdesac of Douglas and illustrated his method which was much the same as Marion's, that is the placing of superimposed purse-string sutures in Douglas' pouch, thus obliterating the hernial opening and raising the rectum at a higher level in the pelvis. He called attention to the fact that this condition was a definite hernia and should be treated as such.

Keyes[12] in 1915, wrote as follows: "Primary vaginal wall prolapse and traction on the cervix in multiparae, is usually preceded by a smaller or larger rectocele and because of the high vaginal attachment posteriorly to the supravaginal cervix, it not only may elongate the cervix but also drag down other attached and contiguous tissues and organs e.g. . . . . .

"The peritoneum of Douglas' pouch attached as it is down the whole length of the posterior wall of the cervix and also for 3 or 4 cm. down the upper third of the posterior vaginal wall and then reflected on the rectum is dragged downward and elongated both by the elongating cervix as well as also by both the posterior vaginal wall and rectal traction."

"(This Douglas' pouch elongation and deepening often forms the sac of a hernia which may contain sigmoid or small intestine or omentum, or both.)"

"In primary anterior vaginal wall prolapse and cystocele, Douglas' pouch, attached as it is to the whole length of the cervix, posteriorly, is dragged down (if perhaps to a less degree), much the same as in posterior vaginal traction." Prolapsus uteri is discussed in detail.

Jones,[11] 1916, brought out the fact that a deep pouch of Douglas is an important cause of uterine prolapse and he stated that downward pressure made in the culdesac against the posterior vaginal wall will demonstrate a strong pull on the uterus. He advised the closure of the culdesac for this reason; he also felt that this accounts for uterine prolapse in virgins, as these individuals always have a deep posterior culdesac of the congenital type.

Findley,[3] 1917, discussed prolapse of the uterus in nulliparous women quite in detail, giving two case reports and a general review. The following is quoted: "Freund finds prolapsus occurring in the more advanced ages of nulliparous women begins as a hernia of the pounch of Douglas. As the pouch deepens, the uterus and the anterior vaginal wall descend. As a rule, this condition begins in early youth and develops slowly. Associated with the congenital deepening of the pouch of Douglas, Freund finds an abnormal inclination of the pelvis."

Frank,[4] 1917, stated the following on repair of enterocele: "Blunt dissection with the finger exposes the sacrouterine ligaments behind the cervix. The posterior culdesac is either bluntly pushed upwards, or if this is impossible, the peritoneal cavity is opened. The peritoneal opening is closed by a superficial purse-string suture, taken with the peritoneum at as high a level as possible. This suture includes the posterior surface of the cervix, the peritoneum along the pelvic wall (beware of the ureters:) and on the anterior wall of the rectum. The subperitoneal space is closed by a chromic gut suture including the posterior wall of

the cervix, the sacrouterine ligaments (grasped as far back as possible) and the anterior rectal wall.''

The same author, Frank,[5] the same year, (1917), further stated: ''The upper portion of the vagina owes its support mainly to the uterus. If this organ descends, the vagina invaginates and prolapses. If the thin, but firm fascia covering the posterior vaginal wall (lowest part of Douglas' culdesac) is torn, a hernial protrusion may descend through the gap and present in the rectovaginal septum or protrude from the vulva, forming an 'enterocele'.''

''Repair of enterocele and high rectocele. To simplify the operation two areas of denudation are laid out by applying Ochsner forceps. The first forceps is placed at what would correspond to the crest of the rectocele. The cervix is

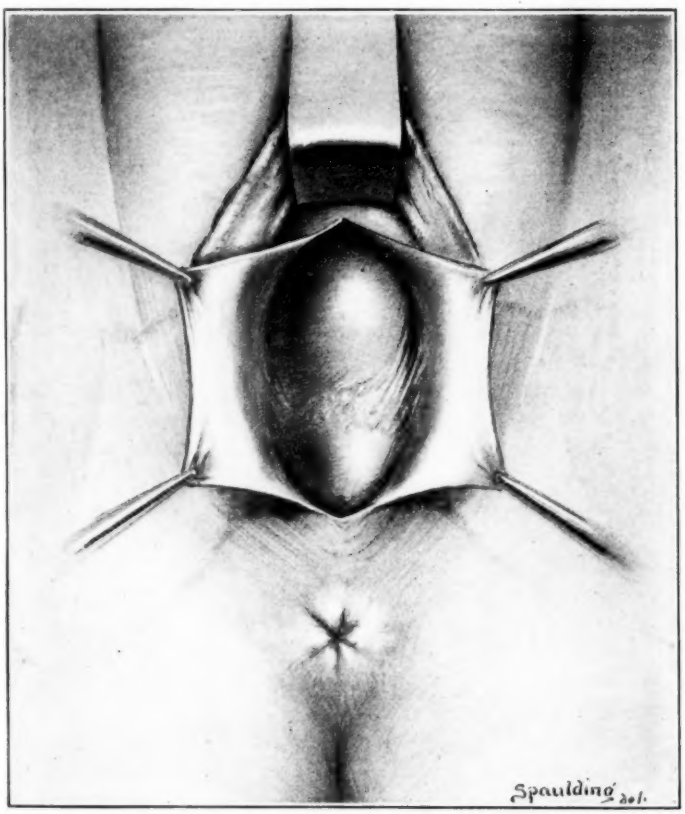


Fig. 2.—Enterocele (posterior vaginal hernia). Vaginal route. The pelvic floor is opened, the culdesac of Douglas, filled with omentum or intestine, is shown bulging over the rectocele and separated from it by a layer of fibrous and adipose tissue. The cervix and bladder are held under the retractor. Adapted from Ward.

now exposed. With the cervix as the upper point, an Ochsner forceps is placed laterally on each side between the upper and lower limits. An oval denudation of the posterior vaginal wall is then made within these fixed points.''

''1. The peritoneum may be pushed back, or may be opened and obliterated from within as high up as possible by means of a catgut purse-string suture.''

''2. A slight amount of blunt dissection exposes the sacrouterine ligaments, subperitoneally. Laterally the rectum is separated for ½ inch from the vaginal mucosa. A purse string of medium chromic gut is passed, taking in the left

sacrouterine ligament, the posterior wall of the cervix (above the fornix), the right sacrouterine ligament, the rectal fascia, exposed by reflecting the vaginal mucosa. When this section is tried no protrusion of peritoneum or rectum remains. The mucosa is sutured in turn."

"3. An adequate repair of the perineum follows the above-described method.

The author continued as follows: "Pronounced descent of the rectum or of Douglas' culdesac (enterocele) may result independent of demonstrable lacerations. The cause, nevertheless, in most instances, is directly due to the trauma of childbirth. Repair of the lower two segments in these cases would cause but little improvement. The peritoneal reflection may appear at the vulva, and the pouch

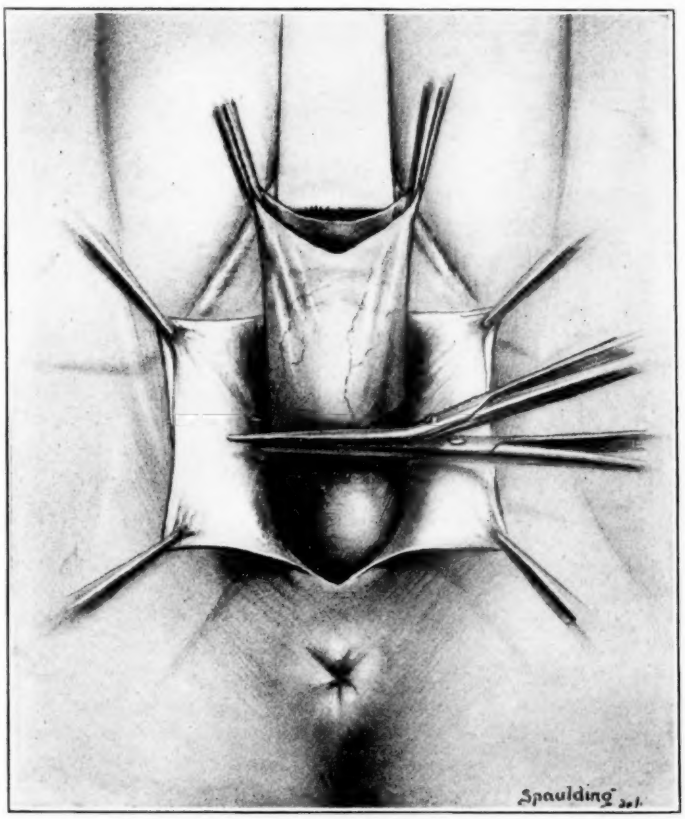


Fig. 3.—Enterocele (posterior vaginal hernia). Vaginal route. The culdesac is dissected free, opened, contents reduced, clamped, excess cut away and base tied with a running stitch of catgut. The rectocele is distinctly shown below the clamp. Following removal of culdesac, the uterosacral ligaments are united and a high perineorrhaphy performed. Adapted from Ward.

may contain intestine. Not infrequently, the anterior rectal wall also prolapses through the vulva as part of the protrusion. The hernial opening is bounded laterally by the sacrouterine ligaments. This upper hernia in the pelvic floor must be repaired before the levator and transversus are united."

Gilliam,[7] 1917, in a paper on "*Prolapse of Uterus*," made the following statement: "In the erect posture or when the patient bears down, the uterus escapes through the vaginal outlet and hangs between the thighs supported by the vaginal wall and the uterine ligaments. The folds of peritoneum which form

the culdesac of Douglas and the uterovesical fold follow the uterus in its downward descent . . . ."

Pollock,[15] in 1917 described the case of a colored girl, 13 years old, who consulted him for prolapse of the uterus, which was first observed by her mother when the child was eight years old. Gonorrhea was present and after three weeks antigonorrheal treatment, the operation was performed in three steps: first, anterior colporrhaphy with oval denudation: second, perineorrhaphy, according to the method of Emmet, and third, laparotomy. The posterior culdesac was found to be very wide and deep and filled with numerous intestinal loops. These were lifted out of the depth of the pelvis, with the patient in the Trendelenburg position. The appendix was removed, the culdesac was obliterated, the tubes were resected and the round ligaments were used to cover the stumps of the tubes and to hold the uterus forward. The convalescence was uninterrupted and the patient left her bed on the 16th day. This writer considers that the prolapse in this case was due to a congenital cause. A detailed discussion is given and a review of the literature.

Williams,[17] 1917, explained the relation of the culdesac to prolapse of the uterus as follows: "The first step in prolapse of the uterus is a displacement of the uterus downward and forward, giving rise to the deep culdesac which has been described by Moschcowitz and Jones as predisposing to prolapse of the rectum. As the cervix descends still further, traction on the posterior portion of the pelvic fascia increases the depth of the culdesac and weakens the rectal supports. Pressure of prolapsed small intestine upon the enlarged culdesac increases the damage still further. If the rectal support is sufficiently weakened, and especially if there has been injury to the sphincter ani, procidentia of the uterus is followed in time by prolapse of the rectum." The Moschcowitz operation closes the hernial opening and restores the tension of the pelvic fascia by putting a reef in it just posterior to the cardinal ligaments. This operation then is of great value as an adjunct to the treatment of uterine prolapse.

Clark[1] 1921, was of the opinion that a prolapsus is a hernia of the uterus in which Douglas' culdesac is a chief propagating factor. Merely, therefore, to repair the external exit of this hernia—the vaginal outlet—by a plastic operation and to suspend the offending organ leaves the chief intermediary part of the hernial tract, Douglas' pouch and the upper portion of the vagina, still untouched. Under this plan, therefore, recurrences will be too frequent. With the uterus descending in midposition or retroflexion the intraabdominal impact is directed into Douglas' culdesac, after which the hernial sac is thrust downward, driving a wedge between the rectum and the vagina. Complete prolapse is then a matter of relatively short time. It becomes quite obvious, therefore, that to restore these cases to normal health, the hernia interposed between the rectum and the upper part of the vagina must be obliterated. The author, in women beyond middle life, usually performs a vaginal hysterectomy, obliterates the culdesac of Douglas, brings the round ligaments together and implants them in the vagina, following the Charles Mayo plan. In his paper 100 cases were reported, in three of these cases in which the posterior culdesac was so markedly pouched that it appeared outside of the vulva, he followed the Moschcowitz technic, and then performed a partial abdominal hysterectomy and implanted the round ligaments in the cervical stump. He laid stress on the fact that care must be used not to include the ureters in the stitches in performing the Moschcowitz operation.

Hartman,[8] 1921, in regard to diagnosis said: "In vaginal enterocele associated with an anteversion of the uterus, often, as Muret has indicated, with an

anterior abdominal hysteropexy, the tumor occupies only the posterior wall of the vagina, it is situated higher than the usual colpocele.''

Hundley,[10] 1922, quoting Jones stated that the closure of the culdesac allowed the weight of the intestines and the intraabdominal impact to fall on the uterus, bladder and anterior abdominal wall, while the deep culdesac allowed this impact and weight of the intestines to fall on the anterior rectal wall, or posterior vaginal wall, thus exerting a downward pull on the uterus which helped to in-

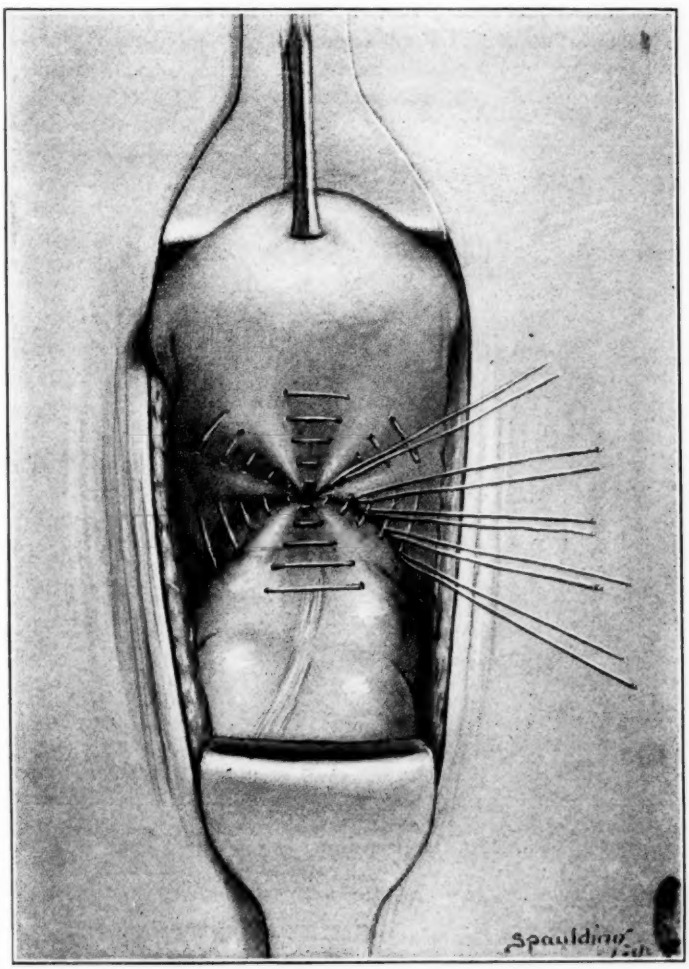


Fig. 4.—Enterocele (posterior vaginal hernia). Abdominal route. Contents of enterocele pulled up and reduced. Illustrating the placing of linen sutures in superimposed layers to obliterate the culdesac of Douglas. The first suture should be placed as low as possible.

crease the prolapse. A congenitally deep culdesac and faulty development of the pelvic fasciae is thought by many to be the cause of procidentia in virgins.

Ward,[16] 1922, in a well illustrated article reviewed the scant literature on the subject of posterior vaginal enterocele. He favors the Mayo vaginal hysterectomy operation for prolapsus and in addition obliterates the culdesac of Douglas and performs an adequate perineorrhaphy. When operating by the abdominal

route he follows the plan of Moscheowitz. The technic of his method is described in detail.

Frank,[6] 1922, described the true hernia of a nulliparous woman with a high firm perineum. The mass contained only a little of the rectum, and consisted mainly of the posterior peritoneal pouch filled with ascitic fluid due to cirrhosis of the liver.

Culbertson,[2] 1923, in his monograph on *Surgery of the Female Pelvis*, discussed this lesion. He feels that the simple surgical measures *per vaginam* are uncertain owing to the difficulty of obliterating the culdesac of Douglas. When the protrusion takes the form of a pediculated swelling, the sac is opened by a vertical incision over its circumference; the contents of the sac are reduced through the ring; and the peritoneum is closed by a circular suture as high up

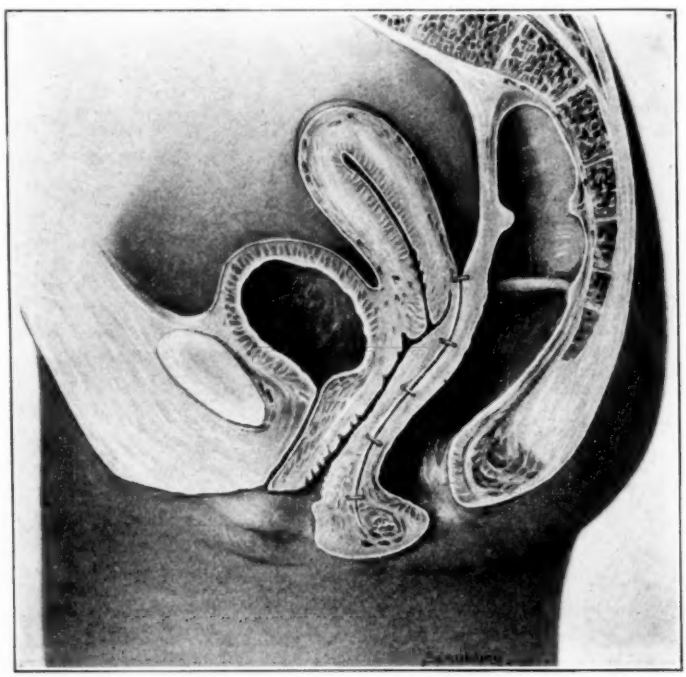


Fig. 5.—Enterocele (posterior vaginal hernia). Abdominal route. Sagittal section of the pelvis showing the linen sutures tied and the pouch of Douglas obliterated.

as possible. The sac is extirpated, after which the redundant portion of the vaginal wall is trimmed away and the exposed edges approximated. The author advocates the above method in uncomplicated cases. In the complicated cases, as in the presence of adhesions, he advises the abdominal route, and quotes Sweetser's case (1919) as one in which the existing complications would have made the vaginal route inadvisable.

Heiman,[9] 1923, reported a case of perineal hernia the sac of which was formed by the prolapsed pouch of Douglas. The patient, a woman 47 years of age, had had 7 operations, five of which had a direct bearing on her present condition. As a young woman she had developed a uterine prolapse. Her first operation was a vaginal one for the relief of this without success. During the next two months she had two laparotomies for the same condition before it was improved. Later, both tubes, ovaries and the uterus were extirpated abdominally for a re-

current prolapse. Following this she developed bulging and protrusion of the vaginal walls, and the vagina was completely closed in an attempt to overcome this. The next two operations were for umbilical and ventral herniae.

On examination the perineum was found to consist only of skin, and on coughing, a mass the size of a lemon protruded in the median line between the vagina and the rectum.

The patient was operated upon by Dr. Sigmar Stark, the vaginal route being employed. An incision was made in the median line posterior to the hernial mass and the skin was dissected back, exposing the hernial sac which was formed by the culdesac of Douglas. The sac was separated from the bladder, excised as high as possible, and closed by a transverse suture. The rectum was then freed from the hernial sac and turned in behind the new perineum formed by the approximation of the levator ani muscles and the deep fascia of each side. The healing was satisfactory except for a small area of superficial sloughing which was slow in granulating in. The patient was discharged with a good result in thirty-one days.

The four cases herein reported were taken from my personal records to illustrate the obliteration of the culdesac of Douglas in connection with three of the accepted methods of surgically treating prolapse of the uterus; namely vaginal hysterectomy, abdominal hysterectomy with cervicopexy, and the transposition operation.

CASE 1.—Mrs. C. G., age 65, was admitted to my service at the Carney Hospital, on Nov. 20, 1922. Her chief complaint was "falling of the womb" for the past twelve years. The parts were completely extruded for the past three years. Menstruation began at thirteen, always regular, not painful and the menopause came on 14 years previously. She had been married 28 years and had had three children, the first delivery was instrumental and she stated that she had been badly torn. The puerperia had been normal.

The physical examination was negative except for marked obesity and a mitral regurgitation which was well compensated.

Diagnosis. Procidentia. Large Cystocele. Enterocele. Rectocele. Ulceration of Vagina.

Because of the ulceration the patient was kept in bed and treated with vaginal applications until Nov. 29, 1922, at which time she was operated upon under ether anesthesia.

At operation the uterus was found to be very small, about the size of an egg. In my opinion it was found too small to interpose, because it was feared that the heavy bladder might push it down again. For this reason vaginal hysterectomy and double salpingooophorectomy were performed, the broad ligaments were then united and transposed between the bladder and the vagina. A large hernia of the culdesac was present, this was filled with small intestine, the sac was opened and the contents reduced, the sac was freed from the posterior wall of the cervix and from the anterior wall of the rectum and laterally as far as the sacrouterine ligaments, it was clamped, resected, its base was tied with a running stitch of chromic gut, and the sacrouterine ligaments were united in front of it. A high perineorrhaphy, using the so-called "interposition" or levator muscle operation, completed the operation.

The patient was returned to her bed in good condition, and convaleseed satisfactorily.

On December 20, 1922, the discharge examination showed that the parts had

healed and that there was no bulging on straining or standing. The patient was examined a year later and the result had remained satisfactory.

CASE 2.—Mrs. E. M., age fifty-three, was referred to me at the Carney Hospital on March 14, 1923. Her chief complaint was "dropping of the womb with ulcerations," much discomfort, unable to walk any distance, and slight bleeding for the past month. The menstrual history was unimportant and the menopause had occured three years previously. She had been married twenty-seven years and had had six children and no miscarriages. Her oldest child was twenty-six years old while her youngest was fourteen; three children had died early in fancy. The

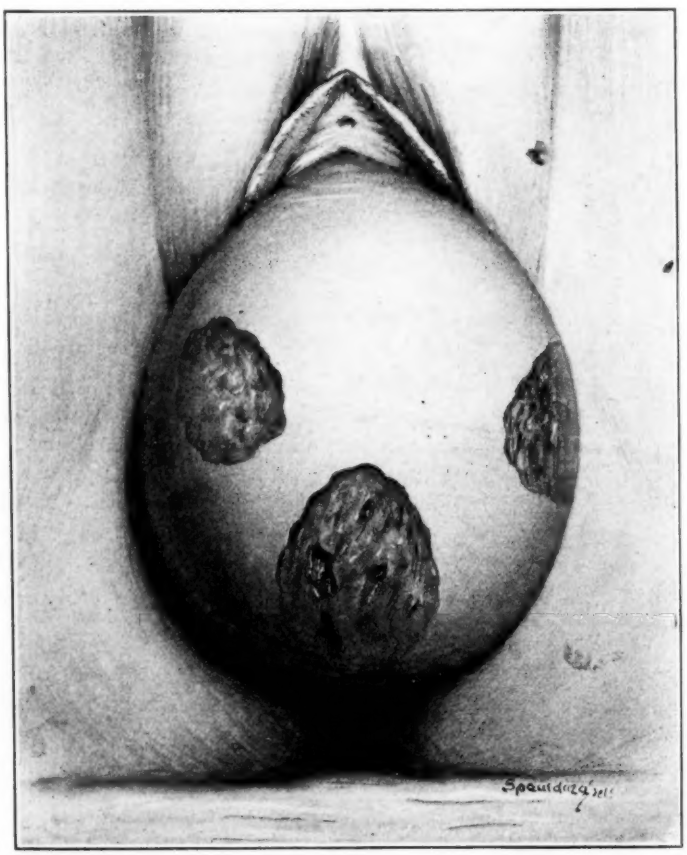


Fig. 6.—Enterocele (posterior vaginal hernia). Author's case. Extreme prolapse of the culdesac of Douglas. Intestinal and omental contents. Deep ulceration.

first delivery had been instrumental and had been accompanied by severe lacerations, the others had been normal.

The past history was interesting inasmuch as she had had three operations for prolapse without success. The first of these had been performed fourteen years previously, and had consisted of vaginal plastics, an abdominal fixation of the uterus, and an appendectomy. The patient stated that bulging at the introitus became apparent shortly after she left the hospital. One year later, thirteen years previous to her admission, she had another operation for prolapse, nothing but vaginal work being done at this time; the patient saw no improve-

ment from this second operation after a short period of time. Four years later, or nine years previous to her admission, another perineorrhaphy was performed, which was also unsuccessful. The patient was told at this time that she could never be cured. She had had her prolapse for twenty-six years and after three operations did not feel improved in the least. The patient consulted me, not because she felt anything could be done for the prolapse, but because she became alarmed at the bleeding which had existed for a month. The physical examination was not remarkable except for a blood pressure ranging from 190/100 to 165/95. Although she had been told that she had diabetes we found no sugar in the urine during her stay in the hospital.

The abdominal examination was negative except for obesity and a well healed right rectus incision. Examination revealed a protruding mass the size of a large grapefruit. This mass was thin-walled and had almost ulcerated through in several areas. It was found to be filled with intestine and omentum, and because of the thin wall and the marked ulceration, there was danger of the contents coming out. The perineum which had been previously repaired was extremely thin and afforded no support, there was a moderate rectocele, and a small cystocele, the cervix was high in the vaginal vault, but could be brought down to the outlet on pressure from above with the abdominal hand. We were then dealing with an extreme type of enterocele which had apparently been overlooked at the previous operations. The danger to which the patient was exposed was that the ulcerations which had gone through the thin vaginal mucosa might extend through the peritoneal layer and thereby allow the intestine and omentum to protrude. She realized the gravity of the situation and consented to stay in the hospital, where she was put to bed and treated expectantly for twelve days, after which time her ulcerated areas had healed. Operated upon on March 26, 1923, the abdomen opened by a median incision, the intestines and omentum were pulled out of the culdesac of Douglas and this pouch was obliterated following the plan of Moschcowitz, by using four rows of superimposed linen sutures. The uterus was found attached to the anterior abdominal wall to the right of the median line, there had been so much traction on this organ that it was markedly stretched and the fundus appeared to be the same size as the cervix. This attachment, therefore, did not seem to be of any value in overcoming the prolapse. The uterus was next freed from the abdominal wall and a subtotal hysterectomy, together with a double salpingooophorectomy was performed. The cervix was closed from before backwards, and the round and infundibulopelvic ligaments were attached to the same. The raw areas were covered over by attaching the peritoneum at the bladder edge to the posterior surface of the cervix, and the stump was fixed to the anterior abdominal wall by a silk suture on each side of the incision. The patient was then placed in the lithotomy position and a high flap perineorrhaphy was performed. Since there was marked atrophy of the tissues in this region the closure was made in one layer, picking up all the available tissue and using chromic gut in the vagina and silkworm gut externally. The patient made an uneventful recovery except for slight superficial sepsis of the abdominal incision at its midpoint. This healed readily after Dakin's dressings. The discharge examination showed the perineum to be well healed, there was no bulging of the anterior or posterior vaginal walls on straining or standing and the abdominal incision was healed. The patient has remained well since and there is no sign of the return of the lesion.

CASE 3.—Mrs. A. F., age fifty-five, admitted to the Carney Hospital, on August 27, 1923. Her complaint was "falling of the womb." The menstrual history was negative and she had passed through the menopause without any untoward symp-

toms. She had but one child 23 years old, and she dated her trouble to the instrumental delivery of this child. She complained of all the symptoms which accompany a procidentia. The physical examination was negative except for the gynecologic condition.

Diagnosis. Procidentia uteri. Posterior enterocele. Operation. August 28, 1923. Under ether anesthesia the uterus was transposed between the bladder and the vagina and the cervix was amputated. Upon opening the pelvic floor there were found both an enterocele and a rectocele. The enterocele was a moderate one; the sac was opened, the contents were reduced, and since the sac did not come up readily, the excess of tissue was trimmed and the edges were approximated

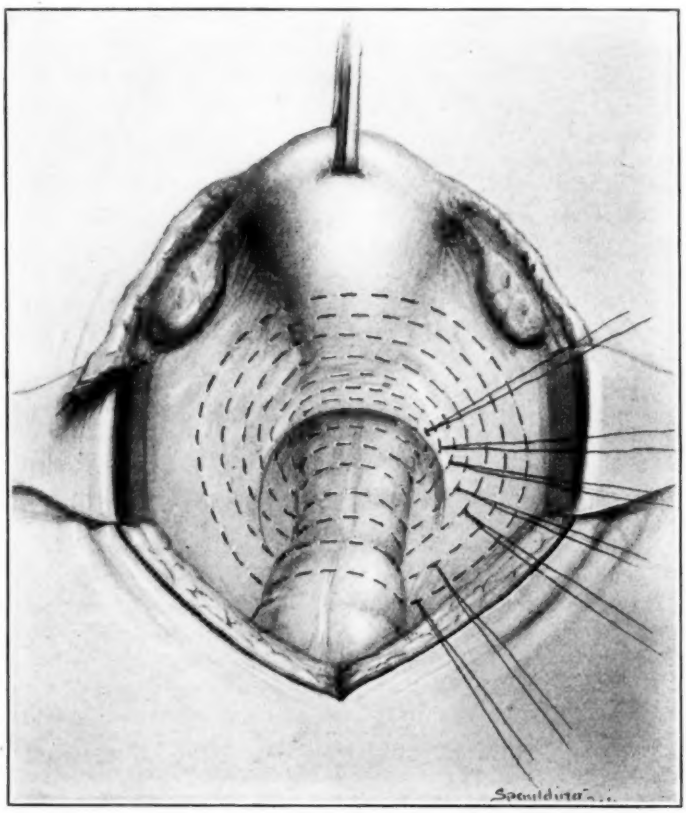


Fig. 7.—Enterocele (posterior vaginal hernia). The Moschcowitz operation. Abdominal route. Adapted from Moschcowitz.

anteroposteriorly with a running stitch of chromic catgut, the sacrouterine ligaments were united with catgut and a perineorrhaphy performed. The convalescence was satisfactory and the patient was discharged on September 12, 1923, at which time the perineum gave good support, the anterior and posterior vaginal walls as well as the cervix were well healed; there was no bulging on straining or standing. Examination on October 6, 1923, revealed a satisfactory result. The patient has reported since that there is no recurrence of her previous trouble.

CASE 4.—Mrs. F. H., sixty-two years. The family history was irrelevant while the past history revealed that she had been suffering from chronic bronchitis for twenty years. She had had two children, the first delivered with forceps. The

puerperia had been normal, and the menopause had occurred when she was forty-two. A total genital prolapse accompanied with incontinence of urine had existed for a number of years. The examination showed a uterine procidentia with a large ulcer on the posterior vaginal wall: the uterus was atrophied, elongated and resembled a cordlike structure; a large cystocele and rectocele were present and in addition there was an extensive prolapse of the culdesac of Douglas.

Operation at the Carney Hospital April 1, 1924. A vaginal panhysterectomy was performed, the broad ligaments were approximated and transposed between the bladder and the vagina after resecting the excess of the vaginal flaps. The culdesac of Douglas was opened and the pouch of peritoneum through which the herniation had taken place was resected. The operation was completed by a high colpoperineorrhaphy. Because of the patient's severe cough spinal anesthesia was administered. She was on the table fifty minutes and stated that she felt no pain although she was somewhat nervous during the operation. The result has thus far remained satisfactory.

CONCLUSIONS

1. A deep Douglas' pouch may be congenital or may follow childbirth; in either case, it plays an important rôle, as a cause of uterine prolapse.

2. The lack of recognition of this condition leads to many operative failures on the posterior vaginal segment.

3. Prolapse of the culdesac of Douglas while rare in extreme types, such as Case No. 2, is not infrequent in the less severe types.

4. The vaginal route is advocated for the simpler cases, while the abdominal route is best reserved for the extreme cases and those which are complicated by adhesions.

5. The operative technic presents no special difficulties, the only exception being that care must be taken to identify the ureters when placing the sutures.

REFERENCES

[1]Clark, J. G.: Surg. Clin. N. Am., Phila., 1921, i, 77-100.
[2]Culbertson, Carey: Surgery of the Female Pelvis. D. Appleton & Co. New York, London, 1923, pp., 50-52, 55-56, 89.
[3]Findley, P.: Am. Jour. Obst., N. Y., 1917, lxxv, 12.
[4]Frank, R. T.: N. Y. State Jour. Med., 1917, xvii, 3.
[5]Frank, R. T.: Surg., Gynec., and Obst., Chicago, 1917, xxiv, 42.
[6]Frank, R. T.: Gynecological and Obstetrical Pathology. D. Appleton & Co., New York, London, 1922, 173.
[7]Gilliam, H. A.: Kentucky Med. Jour., Louisville, 1917, xvi, 506.
[8]Hartman, H.: Gynéc. et Obst., Par., 1921, iii, 327-343.
[9]Heiman, Joseph D.: Jour. Am. Med. Assn., 1923, lxxxi, No. 22, 1876-1877.
[10]Hundley, J. M., and Hundley, J. M., Jr.: Ann. Surg., Phila., 1922, lxxvi, 106-109, 3 pl.
[11]Jones, D. F.: Boston Med. and Surg. Jour., Boston, Nov. 2, 1916, clxxv, 623-627.
[12]Keyes, A. B.: Am. Jour. Obst., N. Y., 1915, lxxii, 663-678.
[13]Marion: Rev. de Gyn. et de Chir. Abdom., 1909, xiii, No. 3, 465.
[14]Moscheowitz, Alexis V.: Surg., Gynec. and Obst., Chicago, 1912, xv, 7-21.
[15]Pollock, W. C.: Med. and Surg., 1917, i, 182.
[16]Ward, George Gray: Jour. Am. Med. Assn., 1922, lxxix, 709-712. Discussion: 712-713.
[17]Williams, J. T.: Med. and Surg., St. Louis, 1917, i, 188-193.

395 Commonwealth Ave.

THE DANGERS RESULTING FROM APPARENTLY TRIVIAL GYNECOLOGIC PROCEDURES*

By John A. McGlinn, M.D., Philadelphia, Pa.

I WAS brought up in a school of fundamentalists where it was taught, and strictly adhered to, that no intrauterine manipulation, applications or operations should be done unless the patient was under anesthesia. It was held that unless the patient was under anesthesia the vagina could not be sufficiently sterilized to permit intrauterine approach without danger of infecting the interior of the uterus. It was also held that adnexal infection contraindicated intrauterine manipulation and that in the majority of cases the exact condition of the adnexa could not be determined unless the patient was anesthetized. (Note.—This, of course, did not include those cases in which the abdomen was to be opened on account of adnexal disease.) To vary from these teachings was heresy. The modernistic teachings of office diagnostic curettage, the office application of the Rubin test, and its poor relations; the office introduction of stem pessaries; the intrauterine application of radium in the unanesthetized patient and like procedures caused my fundamental soul many pangs. While I did not accept these modernistic teachings *in toto*, I could accept them provided they were purged with the saving grace of anesthesia. It is the unfortunate experience with some of these apparently trivial procedures that I wish to recount. About a year ago I reported to this society the history of four women who had had stem pessaries introduced into their uteri, in a doctor's office. All four suffered evil results, the worst required a complete cleaning out of the pelvis to get rid of the pathology. This report was not unique except that the women were all related and that they followed one after the other in spite of the experience of those that had gone before. The literature is so filled with reports of major and minor evil results of the stem pessary that it would be a work of supererogation to report it here. The few cases which I have to report were done in a hospital operating room under rigid operating room technic, the patient anesthetized and the pelvis examined under anesthesia.

RUBIN TEST

Case 1.—Mrs. A. consulted me on account of sterility. She had been married five years and had never conceived. Her age at marriage was twenty years and that of her husband twenty-five years. She had never been employed in any occupation; her husband was a salesman. The husband denied venereal infection; her

*Read at a meeting of the Philadelphia Obstetrical Society, April, 1924.

history did not suggest it. She had gained fifty pounds in weight since her marriage but her menses showed no change. The family physician had examined a condom specimen of serum and found active spermatozoa. The doctor and his patients had heard of the Rubin test and wished it done before resorting to other examinations or treatments. An examination showed the vulva and vagina normal, with no discernible signs of recent or remote infection. The cervix was normal; the uterus normal in size and position and freely movable. The adnexa could not be palpated. She was admitted to the hospital and received the same preparations as are carried out for vaginal and intrauterine operations. She was taken to the operating room, anesthetized and the pelvis was examined when she was fully relaxed. At this examination the pelvis was found free of all pathology, as far as I could determine.

The vagina and cervix were then sterilized and dried. The Rubin test was made and the gas passed immediately and freely as demonstrated by readings of the mercury column and auscultation over the lower abdomen. We judged that both tubes were open as the sound of the passing gas was heard with equal intensity over both tubal regions.

As soon as she regained consciousness the patient complained of pain in the left inguinal region. I had stated that she would be in the hospital only twenty-four hours—she remained ten days. During all this time she complained of left inguinal pain, had a moderate fever and a leucocytosis. Pelvic examination at first disclosed only a tender left side. Later a tubal mass the size of an egg developed. She still has the pain and the mass, which have persisted in spite of rest and treatment. It is likely that she will eventually have to have her abdomen opened to clear up the pathology.

I believe this case to have been one of latent infection that was not recognized, prior to the test. Whatever the cause of the condition may be, we used every precaution to avoid this accident. It shows that in spite of every precaution such an unfavorable result may attend.

CASE 2.—Secondary sterility with a movable retroverted uterus. Before opening the abdomen Dr. Averett did a Rubin test. I was present at the operation and was in charge of the gas tank. The Rubin apparatus was tested prior to making the test and was found to be in perfect working condition. Auscultation over the abdomen showed gas passing freely through both tubes. At no time did the pressure go over 30 mm. of mercury. This extremely low reading called for investigation, and we naturally felt that the machine was out of order. It was tested after the operation and found to be in good condition.

When the abdomen was opened there was the unusual rush of gas through the incision. When the fallopian tubes were brought into view the fimbriated extremities were closed and both tubes had ruptured about 1½ inches from the fimbria. One tube contained sacculated pus and the other clear fluid. It was deemed inadvisable to attempt any conservative measures and both tubes were removed.

In this case there were pathologic lesions of the tubes which were not recognized before operation. The patient was stout, the enlargement of the tubes slight and an experienced and careful man could not discover the pathology. It would have been absolutely impossible for any one to discover the lesions from an examination without anesthesia.

The walls of the tubes were so thin that a pressure of 30 mm. of gas ruptured them. What would have been the end-results in this case had not the abdomen been opened immediately is conjectural.

CASE 3.—Secondary Sterility. Mrs. B., married five years, had a miscarriage at two months early in her married life. No assignable cause for the miscarriage

can be elicited. She made a good recovery from the miscarriage and as far as she can recall she had neither fever nor chills. Contraceptive measures had not been used but she had not conceived since the miscarriage. Her family physician finding a retroverted uterus and thinking this to be the cause of the sterility asked me to correct the displacement.

On examination I found a retrodisplaced uterus, which while not fixed, was not freely movable. No enlargement of adnexa could be outlined. Under anesthesia there was found evidence of pelvic adhesions, but no enlargement of the tubes or ovaries. She had a number of small cervical polypi which were removed and the cervical canal curetted. At this point it was decided to test the patency of the tubes with the Rubin apparatus. The mercury column rose to 160 mm. and oscillated at this level. Auscultation of the abdomen was not done in this case.

The abdomen was opened with the usual escape of gas. The uterus was retrodisplaced, both tubes and ovaries were buried in adhesions to the broad ligaments. The left ovary was normal. The tube was bisected from uterus to fimbria in an attempt to leave at least a part of an open tube. The entire lumen of the tube was eliminated; the tube was removed and the ovary left *in situ*. The right ovary was so grossly diseased that conservation could not be considered. The fimbriated extremity of the tube was open but inflation with air through the ostium showed it to be occluded about the middle. The entire tube was thickened and nodular. About a half inch away from the occlusion on the uterine side gas was seen bubbling through a small rupture of the tube. No attempt was made to save any part of this tube.

In this case pelvic pathology was suspected and we could not have used the Rubin test except that the abdomen was to be opened. It is conceivable that the diseased condition of the pelvis might have been missed if this case had not been examined under anesthesia. It demonstrates the danger of rupture of a tube at a pressure lower than that usually given as the danger point.

RADIUM AND X-RAY

CASE 4.—Mrs. D. consulted me on account of profuse leucorrheal discharge which had persisted for several years in spite of active treatment by several recognized authorities. The usual local hygienic and vaccine methods had proved unavailing. On examination the cervix was eroded, greatly enlarged, soft and boggy. The uterus itself was about normal in size, anterior in position, and freely movable. The tubes and ovaries could not be palpated. In view of the persistence of the discharge and the cervical pathology in spite of the best of treatment, it was felt that nothing would be gained by a continuation and repetition of the treatment. It was therefore advised that she should be treated with a small dose of radium. She entered the hospital, prepared for operation, was taken to operating room and anesthetized. Examination under anesthesia disclosed no evidence of infection of any part of the uterus except the cervix. A capsule containing 50 mg. of radium was placed in the cervical canal and the erosions lightly brushed with the cautery. The radium was removed in three hours, this giving a dose of 150 mg. hours. The day after operation the patient complained of pain in the left side which has continued until recently. The pain was due to a pelvic cellulitis evidently due to an old unrecognized infection being lighted up by the radium. The eroded cervix and discharge are cured but she now has a small inflammatory mass which will likely disappear in time.

I had a similar case a few years ago in which x-ray treatments were given for a fibroid of the uterus. In this case a large pelvic abscess developed which required operation.

INTRAUTERINE INSTRUMENTATION

CASE 5.—This was a case of sterility and dysmenorrhea, which was treated by gradual dilatation of the cervical canal, in the office of a physician and I presume that he took every precaution to avoid infection. The woman had never been pregnant and there had never been any gonococcus infection in her or her husband: it is likely, therefore, that there was no pelvic infection prior to the treatment. Infection did develop after the treatment and I first saw her in consultation with a prominent gynecologist in another city. He operated on her and on account of her youth and desire for children he was conservative. After this operation she later developed a large pelvic abscess which he drained through the vagina. Some months later she developed a large pelvic mass which filled the pelvis and extended into the lower abdomen. I operated and found a large abscess with the intestines and pelvic structures all matted together. It was impossible to do anything more than establish drainage as the patient was in a very bad condition. The case ended in death. This is a tragic ending in which an unusually talented woman lost her life as the result of an apparently trivial procedure.

I could go on multiplying these records but I take it these few cases are sufficient to illustrate my point of view. After many years in this work I still stand on what I was taught in the beginning, namely,—that intrauterine approach must always be surrounded by the greatest safeguards. These safeguards are thorough sterilization and elimination of pelvic infection. In the main these safeguards can only be given in a hospital, and office operations and examinations have no place in gynecology.

1530 LOCUST STREET.

SOME PHASES OF DYSMENORRHEA*

By C. Jeff Miller, M.D., F.A.C.S., New Orleans, La.

THE frequency of dysmenorrhea has possibly been overestimated by the medical profession because of the fact that gynecologists particularly see only the pathologic cases, those patients in whom the condition is sufficiently severe or disabling to force them to seek advice for its relief. Norris' figures of 75 per cent are certainly too high, though I am inclined to think that recent English statistics giving an incidence of 10.8 and 5.6 per cent respectively are probably too low. At any rate, we meet the condition sufficiently often in our practice to make its cure a matter of concern, particularly because, since all forms of treatment are still largely empirical and based on unproved theories, our results are often very unsatisfactory.

The term dysmenorrhea is variously used to denote either a symptom or actual pathology, but to most of us it carries the implication of pain varying in severity from slight discomfort to a disabling condition which recurs with more or less regularity at each menstrual period. It is divided into two great classes, intrinsic or essential dysmenorrhea, and extrinsic or secondary. The first and most important group comprises those cases, to quote Blair-Bell's excellent definition, "in which the menstrual pain is due to some inherent abnormality of the organs of menstruation or of the physiological processes connected with the function." Secondary or extrinsic dysmenorrhea represents simply an aggravation of symptoms existing at other times and resulting from various pelvic and abdominal lesions as salpingitis or appendicitis. The treatment is simple and eminently satisfactory, as the cure of the obvious lesions present practically never fails to give relief. I shall therefore limit my remarks entirely to the essential type.

The etiology of dysmenorrhea is still far from clear and many ingenious theories have been advanced to explain its occurrence. Certain of them are no longer tenable in the light of modern investigation, such as the explanation that the pain is due to the swelling of the endometrium with the consequent decrease in the diameter of the internal os, or that it represents only the normal physiologic uterine waves which are unnoticed in healthy women but cannot be ignored in women whose mental and physical balance is less stable. Victor Schultz's theory that delay in the transformation of the infantile uterus into the mature organ causes at the menstrual time "stretching" pains in the insufficient uterine wall has never been completely established.

*Read at a meeting of the New Orleans Gynecological and Obstetrical Society, January, 1925.

Certain cases in which no obvious pathology is present are loosely grouped as ovarian neuralgias, a thoroughly unsatisfactory and illogical classification.

On the other hand, certain anatomic conditions recur with sufficient regularity in these cases to give us some basis from which to reason. First come the various malpositions of the uterus, nearly always present in some form or other. Retroversion and retroflexion seldom cause dysmenorrhea, but anteflexion, particularly when accompanied by retrocession also, the rotation of the uterus upon its longitudinal axis, which results in a certain type of prolapse, is found in a large majority of cases. This is the so-called obstructive theory, that the blood, dammed back into the uterine cavity, especially when the condition is accompanied by a stenosis or cicatricial formation at the internal os, becomes clotted and acts as a foreign body, giving rise to cramp-like pains as it is forced through the narrow opening. Just what is the cause of these misplacements, particularly in young women, we are not prepared to say, though several writers, among them W. P. Graves and Blair-Bell, have very properly pointed out that they are not truly congenital, as they are usually called, but probably occur at the time of puberty when the uterus takes on very rapid development and when its full growth is probably retarded by a partial interference with the blood supply. This brings us to a second tenable theory, that dysmenorrhea is caused by a greater or lesser degree of hypoplasia, an under-development of the various genital organs and more particularly the uterus. It is into this class that dysmenorrhea due to anteflexion might fall also, since anteflexion is not only a mechanical phenomenon, but also, as we have just pointed out, a form of defective development. Since the time of Marion Sims, hyperplasia of the endometrium has been regarded as a cause of dysmenorrhea, a view which is strengthened by the fact that curettage in many cases gives prompt relief. But routine examination of the scrapings following curettage has shown that chronic endometritis is a rather rare affection, and we must look elsewhere for the explanation of those cases in which the procedure gives relief. Many investigators hold that certain instances of dysmenorrhea are due to a psychoneurosis, while others would rather loosely charge them all to this cause. But dysmenorrhea of the severe types occurs too often in well-balanced, un-nervous patients to be explained entirely on that ground. Again, it is rather important to decide whether the neurosis is primary or secondary to the dysmenorrhea. It is easy to conceive that with the constant recurrence of pain, often very severe, nervous exhaustion is likely to occur, at least during the flow and that, as time goes on, the effect of each period will last longer and the reaction from it be less prompt, so that eventually a constant nervous irritation is

maintained and the patient becomes thoroughly neurotic, though certainly her neurosis is not primary.

The treatment of dysmenorrhea, as I have already pointed out, is highly unsatisfactory, largely because its true causes are not yet understood. Most logical of all treatments, especially in young, unmarried women, are the general hygienic measures. It is astonishing how frequently we find young girls violating all the laws of proper living. There is no more valuable prophylactic measure than regular daily exercise, such as work in a gymnasium, tennis, horseback riding and walking, and such exercises should be continued, at least in moderation, through the actual flow. Constipation should also be corrected, not only for the sake of the general health but particularly because during the period impacted feces naturally add to the pelvic congestion already present and so markedly increase the pain. I have frequently found that a simple laxative or purgative taken just before the flow is expected to appear will either eliminate or diminish a large part of the pain usually experienced. The daily bath should be continued through the period, and sufficient sleep at regular hours is imperative. The correct mental attitude is also very important. The patient who anticipates a trying experience and prepares for it in advance by changing her entire mode of life during the time, who goes to bed with hot water bags and anodynes even before the pain appears, usually gets just what she expects. I am not denying that the pain is frequently severe enough to demand these and even more decided measures of relief, but the point that I am making is that the patient should wait until the actual need arises before she institutes them. In short, the general treatment for dysmenorrhea lies in correct hygiene throughout the month and particularly throughout the period. Patients should be taught that menstruation is a function which is not pathologic in itself, and that a large part of their cure lies in their own hands.

Various drugs have been used to relieve the acute features of the condition. Aspirin is routine, and codeine and morphine are occasionally necessary, though they should never be prescribed without the strictest indications and their use should be limited in every way. Atropine sulphate given two or three days in advance of the flow sometimes gives excellent results. Benzyl benzoate, one of the newer remedies, has enthusiastic advocates, but I have found its results far from uniform. Guaiacum, bromide of potassium, luminol, etc, all have certain virtues but their effect at the best is temporary and in no sense curative. I have found that a hot bath taken just at the onset of the flow, and sometimes followed by a warm enema, frequently gives results better than those usually obtained from drugs, and I always advise my patients to try these simple measures of relief first.

I am rather interested in the present tendency to resort to organo-

therapy on the ground that hypoplasias are of frequent occurrence. The various theories which have been evolved in regard to the action of the active principles of the ductless glands are so fanciful and I might almost say so meretricious that I believe it is high time we were collecting our actual results instead of administering such medicaments indiscriminately. Can the administration of the individual and combined extracts of the various ductless glands cure developmental errors, and what percentage of cases are relieved by such treatment? In the first place I am wondering whether developmental errors are so frequent as we have believed in the past. The most careful bimanual examination still forces us to form our opinion of the uterus largely by the condition of the cervix, and a uterus which has been set down as infantile will often reveal itself, if the abdomen be opened for other reasons, as of normal size and development. Again, an incompletely developed uterus will often permit the passage of a sound to normal length. And just what is a normal uterus? We have no absolute standards by which to judge. If the cervix is long and conical, with the anterior lip almost absent and the anterior vaginal wall short, we are usually dealing with an undersized, acutely anteflexed uterus, but even in so obvious a case as this we may be mistaken. And granting that these conditions do exist, how far does organotherapy help? My personal experience in the treatment of dysmenorrhea and the sterility which so often exists with it by such means, in no ways coincides with the enthusiastic reports found in the literature. In the occasional case it has acted like magic, though I have had better results with thyroid extract than ovarian, which is scarcely logical, but my results on the whole are largely disappointing. I still feel justified in resorting to it when I have reason to believe that there is aberrant function, and I can find no other definite cause for the dysmenorrhea, but I must admit that I use it largely on the principle that it can do no harm.

In the line of operative treatment, however much we may decry the use of the curette, dilatation and curettage still remain the commonest form of treatment in the severe cases and probably give the largest percentage of temporary and permanent cures. The short time at my disposal did not permit an accurate review of my records, but a cursory investigation shows that some 40 per cent have obtained permanent relief, while from 25 to 40 per cent more have obtained partial or temporary relief, results quite as good, I think, as any other method of treatment can show. The reason for the relief is still a matter of debate. The pain may be due to a spasmodic contraction of the circular fibers at the internal os or to an undue amount of connective tissue at that point, but the fact remains that a thorough divulsion of the cervix, with or without curettage, rarely fails to give at least temporary relief. When it is combined with the glass intrauterine

stem the results are even better. In a series of fifty-eight cases which I was able to follow up from one to ten years, 45 per cent reported permanent and 36 per cent partial relief, making only 19 per cent in whom the operation entirely failed. Of course this procedure has very definite limitations. It can be used only in dysmenorrhea of the definitely obstructive type, when an infantile uterus is present, and when there is no suspicion of infection. It is unphysiologic, I admit, but in spite of that fact, if the stem is worn for two or three menstrual periods, it usually gives results.

The dissection of the bladder from the anterior wall of the uterus above the internal os has not been so successful in my hands as to justify its continued employment. The various operations on the cervix, particularly those of Dudley and Pozzi, are of little value. They are largely based on the mechanical theory that the kinking of the cervix in anteflexion causes obstruction and were devised with the idea of straightening out the canal. Not only is the pathology faulty but the after-condition of the patient is frequently worse than the first. The everted edges of the cervix give rise to cystic changes and leucorrhea, and repair is often necessary, just as in the ordinary cervical tear after labor. Blair-Bell is an enthusiastic advocate of anterior hysterotomy but I consider the procedure too radical to be employed in any but the most severe cases and even in these the results are not noteworthy.

Membranous dysmenorrhea is perhaps the most trying phase of this condition and all types of treatment are highly unsatisfactory. Repeated curettage usually fails, sterility is the rule, and many of the patients are also neurotic. Personally I have found galvanism a very valuable remedy. I have relieved several intractable cases by the use of the negative pole in the uterine cavity, using from 10 to 15 Ma. for five to eight minutes within the week prior to menstruation. I should also like to report one case treated by radium for what it is worth. The patient had reached such a state from continued suffering that relief of some sort was imperative, and I used 25 mg. of the radium element for eight hours, hoping to check menstruation for a few months and give her time to recover her balance, so to speak. Since then, now more than three years, she has menstruated with very slight discomfort and has not passed distinct membranes as before the application. I am not, of course, basing any conclusions on one example but it does suggest that possibly graduated doses of radium repeated at short intervals might be useful in such cases.

We sometimes meet in women over thirty an acute type of dysmenorrhea which has grown progressively worse in spite of treatment and which is gradually resulting in a distinctly impaired physical and mental condition. Fortunately such cases are rare, but we

do meet them occasionally and we cannot ignore them. Radical measures are necessary, and it is still a question whether radiation or hysterectomy is the more conservative procedure. Personally, I use radium very cautiously in women under forty. The dosage sufficient to check menstruation permanently, and any other result is usually without avail, would affect the ovaries also and might lead to loss of balance of the internal secretions. Moreover, radiation does not always check intermenstrual pain. For these reasons, in spite of the additional risk of hysterectomy, I believe I should advocate it if the alternatives were put before me.

512 Hibernia Building. (*For discussion see p. 569.*)

THE WEIGHT FACTOR IN PREGNANCY*

By Lawrence M. Randall, M.D., Rochester, Minn.

(From the Section on Obstetrics, Mayo Clinic)

HEALTH and disease are much less widely separated during pregnancy than in the nongravid state; therefore, every means should be employed to determine accurately the condition of women during pregnancy. There is a concerted program, in operation throughout most of this country, aimed toward educating expectant mothers in maternal hygiene. Such a program should lead more patients to apply for antenatal supervision, thus enabling the obstetrician to observe his patients often throughout the course of pregnancy. With the patient's cooperation the physician should omit no method which will aid in determining the status of her health.

It is hoped that an important result of the present program will be the reduction, and ideally, the elimination, of the toxemias of the later months of pregnancy: eclampsia and nephritic toxemia. The brilliant results from adequate antenatal care are well known. The proof of these results lies in the comparison of morbidity and mortality figures in a series of cases of pregnancy with casual prenatal care with those in a series adequately supervised.

Urinalyses and blood pressure readings begun early and repeated at regular intervals are recognized as fundamental in good prenatal care. Carefully kept weight records have recently received attention in this connection.

There are few data available on the normal gain in weight during pregnancy. Gassner found that during the last three months the average gain amounted to one-thirteenth of the body weight at the end of the second trimester, an average gain during this period of from 3.5 to 5 pounds (1.6 to 2.5 kg.) each month. He determined that the average difference in weight between the beginning and end of

*Submitted for publication January 30, 1925.

labor was 6.56 kg., and that the difference in weight between the end of labor and dismissal from the hospital was 4.84 kg., a total of 11.4 kg. (25 pounds), which he assumes represents the gain in weight during pregnancy. Davis, in a series of patients, comparable in number to this series, found that loss in weight subsequent to delivery and the puerperium ranged between 15 and 20 pounds. From this he concluded that if a woman's weight was normal before pregnancy, her gain should not exceed 20 pounds (9 kg.). If previously underweight, she could be allowed a greater gain, as much as 30 pounds (13.6 kg.).

In the Section on Obstetrics of the Mayo Clinic, the weight records of 200 unselected primiparas with normal pregnancies were studied. The average gain from the onset of pregnancy to delivery was 23.2 pounds (10.5 kg.), of which 7.75 pounds (3.52 kg.) were added in the last eight weeks, or 3.88 pounds (1.76 kg.) for each of the last two months.

One hundred multiparas showed an average gain of 21 pounds (9.5 kg.), of which 5 pounds were added in the last eight weeks, 2.5 pounds (1.2 kg.) each month. As these averages are comparable to the figures of Davis, it seems reasonable to place the increase in weight in normal pregnancy between 20 and 30 pounds. The curve of weight increase in normal pregnancy usually shows a period of slight loss or of only slight gain in the first trimester, and thereafter a more or less steady gain to near term. According to recent observations, a terminal loss in weight occurs near term. Kemper and Zangemeister found that a loss of about 2.2 pounds (1 kg.) occurred in the average case in the last days of pregnancy. In 98 per cent of the cases on which Kemper's calculations were based, the weight at the beginning of labor was less than it had been just before the onset of labor. He explains this loss as due to a slightly increased excretion from the body, a partial excretion of the tissue fluid that is physiologically retained during pregnancy and appears as dropsy in pronounced cases.

Mahnert believes that the fall in weight just before labor is accompanied by changes in metabolism that are characterized by an increase in protein metabolism. He is of the opinion that it is possible that women who do not have this loss in weight have a tendency to eclampsia, and likewise, those who do not have an increase in the excretion of nitrogen corresponding to the loss in weight.

Edema is a sign always to be noted. A certain amount of pitting of the ankles is usually accepted as normal late in pregnancy, but should this become marked or should edema appear elsewhere on the body it becomes pathologic. Wieloch believes that there is a period when there is an actual accumulation of fluid before it is noticeable. He further believes that this tendency toward insidious edema can be detected by systematically weighing the patient.

From the work of these writers, it would seem logical to attach some significance to weight records in pregnancy. A composite curve has been made of the weight records of 200 normal primiparas (Fig. 1). From this curve one might assume that the normal primipara maintains her normal weight or gains only slightly during the first trimester. A few of the patients lost weight during this period. Beginning with the second trimester, there was a gradual, and more or less even, gain until the last four weeks, when there was a tendency toward plateau formation, or at least the curve was less steep. It was not determined whether or not these patients had the terminal loss in weight described by Kemper and Zangemeister.

Among the histories reviewed, there were twelve of toxemic women whose weight records were complete enough to lend themselves to comparison with the normal. There were more than twelve with toxemia, but as such patients are often seen in emergency, no record of the

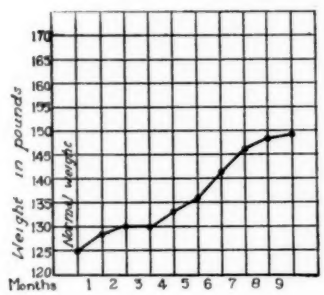


Fig. 1.

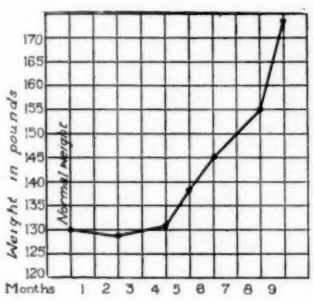


Fig. 2.

Fig. 1.—Average weight gain, normal patients.
Fig. 2.—Average weight gain, toxemic patients.

weight in early pregnancy was available. Of the twelve patients all but one were primiparas, so their weight records may be contrasted fairly with those of the 200 who were healthy primiparas. In the former group the average increase in weight was 44.5 pounds. This is not particularly significant in itself, as pregnant women may gain this much and yet follow a normal course. The pertinent fact is that 25.4 pounds were gained during the last eight weeks; therefore, the composite weight curve for women with toxemia is in contrast to that of normal women (Fig. 2).

During the first trimester, toxemic women have more tendency to lose weight than do normal women. This may or may not be of significance. It has been stated that those women who evince a tendency toward, or definitely develop, toxemia of early pregnancy (toxic vomiting) are more prone to develop toxemia in the later months of pregnancy. However, only two of the twelve women were troubled more than usual with nausea and vomiting in early pregnancy. The re-

covery of weight in these women seemed to be slower than normal, but, early in the third trimester, there is rapid increase. In the case of a toxemic patient who had, until this time, felt below par, this change was looked on as a sign of improvement, and, as a matter of fact, she was subjectively improved. Normally she weighed from 120 to 125 pounds. She weighed 152 pounds by the thirty-second week, when her blood pressure was normal and the urine clear of albumin and casts. In the succeeding four weeks, her weight increased to 175 pounds and she developed headache, blurring vision, casts and albumin in the urine, a systolic blood pressure of 180, and diastolic of 90.

Women with this same type of weight curve may pass through pregnancy without developing toxemia. Also pregnant women who gain considerably more than thirty pounds may not develop toxemia; usually these women show a gradual, and more or less even, increase instead of the rapid rise seen in pretoxemic patients. In other words, it appears that even in such a small series of patients as this, a carefully kept weight record may be an index of approaching trouble. In some cases keeping the weight within normal limits by diet has warded off toxemia. Every woman with an excessive gain in weight is not considered as predisposed to eclampsia, but additional precautions are taken. The patients with abnormal weight curves were studied in three clinical groups:

Group 1, that in which the increase in body weight was rapid, and the urine and blood pressure were normal, but in which there was a complaint of headache and occasional spots before the eyes, and the amount of demonstrable edema was small. In practically all of the patients who carefully followed instructions, satisfactory results by instituting correct maternal hygiene were obtained.

Group 2, that in which the patients failed to cooperate with the physician in the matter of prenatal hygiene. The history is otherwise identical with that of the patients in Group 1.

Group 3, that in which the patients were seen after the usual toxemic symptoms had appeared, but in which weight records were available. Without exception these patients either had failed to carry out instructions as to prenatal hygiene or were seen after the onset of definite toxic symptoms.

ILLUSTRATIVE CASES

CASE 1.—This woman, a primipara, aged twenty-eight years, represents the first group of patients. The previous history was not noteworthy. Her usual weight was 130 pounds. She weighed 125 pounds during the first month of pregnancy. During the first trimester she suffered from considerable nausea and vomiting, and her weight fell to 110 pounds. She began to gain weight about the twelfth week, and when she reported to her physician in the twenty-third week, she weighed 140 pounds, a gain of 30 pounds in eleven weeks. This, however, was only ten pounds more than her normal weight. The urine and blood pressure were normal.

In the twenty-seventh week she reported to the Clinic complaining of headache, and spots before her eyes. The hands, ankles, and face seemed swollen, though there was no definite pitting; and she had noted that her rings were removed with difficulty. The eye-grounds showed a slight relative contraction of the retinal arteries. There were a few râles in the bases of the lungs posteriorly. Blood chemistry and the blood pressure were normal. There was a slight trace of albumin in the urine. She had gained about twelve pounds in five weeks. On a proper diet with moderate eliminative treatment she lost 5 pounds, and symptoms subsided. Under this management she went to term weighing 153 pounds and delivered a healthy babe, weighing 7 pounds and 12 ounces.

This patient complained of only two symptoms, headache and spots before the eyes. The amount of edema demonstrable by pitting was very slight. The urine showed only a trace of albumin and the blood pressure was normal. Eliminative measures drained away 5 pounds of fluid, the loss of which was notable in the tissues of the face, hands and feet. Symptoms subsided and without further gain in weight, she went to term normally.

CASE 2.—This patient, para 2, aged thirty-two years, belongs in Group 2. She had had chronic tonsillitis for several years, and had had a fissure in the anus repaired. She had had a previous pregnancy with no supervision. Delivery was at term but craniotomy had been necessary. The mother was badly torn but was repaired later. She presented herself in the twentieth week. No attempt at prenatal hygiene had been made. The diet had been excessive in quantity, with meat twice a day. General examination was negative aside from badly infected tonsils and pyorrhea. The systolic blood pressure was 140, and the diastolic 90. The weight was 200 pounds. Analysis of the urine was negative. The necessity of a careful diet, improvement in general hygiene, and reporting regularly every two or three weeks, was emphasized, but the patient did not return until the thirtieth week, when her weight was 212 pounds, the systolic blood pressure 180, and the diastolic 102. The specific gravity of the urine was 1.018; the urine was acid in reaction and contained albumin 2+ and granular casts. There were edema and exudate in the retina. After being under observation in the hospital for four weeks, her weight was reduced to 183 pounds, the systolic blood pressure to 150 and the diastolic to 90. The urine showed a trace of albumin with an occasional granular cast. At the end of this time, she left the Clinic. During the thirty-eighth week she delivered a still-born fetus elsewhere. In this case a gain of 25 pounds occurred up to the twentieth week, with evidence of approaching trouble. Failing to adhere to correct dietary measures, the patient gained 12 pounds more in the next ten weeks and developed definite evidence of renal insufficiency.

CASE 3.—This woman, a primipara, aged twenty-eight years, is a representative of Group 3. She had pneumonia when a child, influenza twice, and tonsillitis frequently until tonsillectomy, in 1917. Appendectomy was performed at the Clinic in 1918. Her usual weight was between 120 and 125 pounds. The patient's last period had occurred December 19, 1923. The progress of gestation had been entirely without incident until about the twenty-eighth week, when her ankles became swollen. She visited her physician at this time but nothing was done. Her weight was about 152 pounds. During the next three weeks her face, hands, abdomen and lower limbs became markedly swollen. The week before coming to the Clinic, she had had slight headache and a few spots before the eyes, with increasing dyspnea. She reported at the clinic in the thirty-second week.

On examination the patient was well oriented, complaining only of slight dull

headache, and shortness of breath on exertion. General edema was evident. The right pupil was larger than the left and a little sluggish. The thyroid was palpable. The tonsils had been cleanly removed. There was dental caries present. The heart measured 4.5 by 12.5 cm., the sounds were normal. There was dullness of the lungs over the lower back, with moist râles above, but no breath sounds below. The uterus was the size of a pregnancy of seven and one-half months, and fetal motion was noted. Fetal heart tones were 150 in the lower left quadrant. Edema was extensive, amounting to a general anasarca. Pitting could be produced nearly anywhere on the body. Definite ascites could be demonstrated. The vulva was greatly distended with fluid. The patient weighed 175 pounds, though of rather slight build with small bones. The systolic blood pressure was 188, and the diastolic 144. A twenty-four-hour specimen of urine of 500 c.c. had a specific gravity of 1.018, was acid in reaction, contained albumin, many hyaline, and occasional granular casts. The blood contained hemoglobin 70 per cent, 4,700,000 erythrocytes, and 9,200 leucocytes. The urea measured 61 mg., creatinine 1.8, uric acid 6.2, and carbon dioxide combining power 49. Examination of the eye-grounds revealed that the right pupil was larger than the left, the reflexes and external ocular muscles normal. The fundi revealed little change in the retinal arteries, and full veins. There was definite edema of the right retina with hemorrhages and cotton-wool exudate mainly temporal to disc.

Treatment was instituted. Labor occurred spontaneously in the thirty-fourth week and a viable babe was delivered weighing 4 pounds and 3 ounces. The amount of liquor amnii was normal. The ninth day postpartum the mother weighed 135 pounds, and the nineteenth 115, five pounds less than normally. On account of the premature baby, she remained in the hospital until the thirty-eighth day, when she weighed 124 pounds. The systolic blood pressure was 120, and the diastolic 80; the urine was negative, and the eye-grounds were regressing satisfactorily.

This patient, in the last five weeks of pregnancy, gained 23 pounds, and in the weeks previous 32 pounds. Following delivery under moderate eliminative measures, 60 pounds of fluid were removed from the body. The gross gain and the rate of gain should have been a reliable index of approaching trouble, but they were ignored. The blood pressure and urine at about the twentieth week were found to be normal. At this time, the patient weighed about 152 pounds, 30 pounds more than normally. No doubt there are patients with an equivalent gain who do not develop symptoms, but this patient's course is duplicated often enough to give cause for watching the weight.

SUMMARY

Although the series of cases studied was not large, the average gain of 23.2 pounds by healthy pregnant women coincides with that observed by Davis and others. The number of toxemic patients is also small (twelve), but they fall in very definite weight groups. Noted in conjunction with careful urinalyses and the blood pressure readings, the amount and rate of increase in weight should aid materially in foretelling the toxemias of later pregnancy and make it possible to ward them off. With the increase in the number patients who are applying for, and who are interested in, antenatal care, the physician will be placed in a position to study such patients. This being true, no

method should be slighted that will aid in reducing the toxemias of late pregnancy to a minimum.

REFERENCES

[1]Davis, C. H.: Weight in pregnancy; its value as a routine test. Am. Jour. Obst. and Gynec., 1923, vi, 575-581.
[2]Gassner, J. N.: Quoted by Davis.
[3]Kemper, W., and Zangemeister, W.: Ueber die terminale Gewichtsabnahme Schwangerer. Arch. f. Gynaek., 1924, cxxi, 604-619.
[4]Mahnert, A.: Untersuchungen über Veränderungen des Stoffwechsels und des Körper gewichtes in der Schwangerschaft. Arch. f. Gynaek., 1924, cxxi, 620-630.
[5]Wieloch, J.: Pregnancy edema and prophylaxis of eclampsia. Zentralbl. f. Gynaek., 1924, xlviii, 898-902.

THE HEMOCLASTIC CRISIS TEST IN PREGNANCY*

By William S. Reveno, M.D., and Walter E. Welz, M.D., F.A.C.S., Detroit, Mich.

(From the Medical Division, Prenatal Clinics, Detroit Department of Health)

WIDAL and his coworkers, Abrami and Iancovescu, as a result of extensive experimental work, advanced the theory that the liver along with its many and varied functions, exerts a "proteopexic" action, the purpose of which is the absorption of proteins only slightly broken down, proteins which if permitted to enter the general circulation would produce definite symptoms of protein shock or "hemoclastic crises" as an early manifestation of this direct absorption. As a result of this work, he believed that he had a valuable test for liver function, and while during the clinical investigation, many negative findings were obtained in normal persons, there have also been many positive reactions where various diseases of the liver were known to exist.

This work, because it attempts to throw some light on the complex processes carried on in the liver, has attracted a great deal of attention from medical investigators everywhere with the result that much work has been done in an effort either to verify or disprove the findings originally set forth by Widal. The literature therefore abounds in reports that are frequently conflicting in nature, so that one knows not whither to turn nor whom to believe in this interesting controversy.

Simon and Fontaine[1] call attention to their discovery that in animals, deep anesthesia prevents the hemoclastic shock. They maintain that all the elements of the hemoclastic crisis can be explained simply as a nervous phenomenon of reflex order.

A. Tommaselli[2] reports that injection of blood from the portal vein of a digesting dog into the jugular vein of a fasting dog did not modify the blood in the

*Submitted for publication, January 16, 1925.

recipient dog in any way differently from blood taken at other points. This research thus fails to confirm Widal's doctrine of the proteopexic function of the liver.

E. Delbecq[3] takes up the question of the leucopenia which is produced during hemoclastic shock. He does not consider the leucopenia as characteristic of hemoclastic shock, but maintains the leucopenia is present because the pneumogastric is excited in the shock. Many factors concur in the production of hemoclasis: (1) the rapidity of the ingestion of milk with its mechanical irritation: (2) the temperature of the fluid and the amount of pepsin secreted. In two cases the maximum of leucopenia occurred just at the time of a strong sensation of hunger.

Moutier and Rachet[4] found always an identical positive or negative reaction whether the patients took milk or distilled water. Their conclusion was that the crisis seemed to be conditioned exclusively by neurovascular reflexes which do not depend on the chemical nature of the test substance. They did not, however, observe any causal connection between the crisis and hypervagotonia.

Glaser and Buschmann,[5] in reporting their observations on changes in the leucocyte count, found, in 55 per cent of 353 patients, spontaneous changes in the number of leucocytes (over 2000 per cubic millimeter). If they repeated the count on three different days, they found similar changes in 90 per cent of their subjects. The changes are less frequently pronounced (in 25 per cent of their cases) in the venous blood. These spontaneous fluctuations account for many findings of so-called digestive leucocytosis and hemoclastic crises.

A study of forty cases by Levin[6] has convinced him that pathologic changes occurring in the liver can probably be detected early in their course by the Widal test. The so-called intestinal toxemias and simple cases of indigestion are probably of hemoclastic origin.

Brown,[7] as a result of observations conducted on a series of twenty-five to thirty patients in whom the possibility of a deficient liver function as the underlying cause for "biliousness," migraine, and other forms of periodic headache as well as vague digestive symptoms was considered, is inclined to believe the test capable of shedding some ray of light on the liver function.

Feinblatt[8] concluded, as a result of his findings on the alimentary leucocytosis in eighty normal men, that the normal response to the conditions of Widal's liver function test is uniformly one of leucocytosis.

Testing of liver function was performed by G. Kaboth[9] in thirty-two healthy pregnant and eighteen healthy nonpregnant women. The positive Widal (as judged by leucopenia) occurred in 56.2 per cent of the pregnant and in 16.7 per cent of the nonpregnant. In the majority of the cases, the figure found after the first twenty minutes, showed, in comparison with later values, the greatest difference from the original leucocyte figure. This value was therefore considered chiefly. The original value was generally reached again after two hours. In more than half of the cases, after a few days, a second, and in some cases a third, and fourth examination was made. In 26 per cent of the cases, the results of the later tests were materially different from those of the first. This fact lessens considerably the value of the test.

In thirty-four parturients, Mazza and Iraeta[10] found only 14.7 per cent which showed typical hemoclastic crisis.

In view of the important rôle that the liver plays during pregnancy it seems logical to assume that tests which are designed as measures of the function of this organ should occupy a prominent

place in the prenatal care of patients. The Widal hemoclastic crisis test, because of the simplicity in performing it and because of the uniformity in alimentary leucocytosis in normal subjects as reported by Feinblatt[8] was thought to lend itself admirably to a study of liver function in a series of patients in attendance at a prenatal clinic. Accordingly, the technic as proposed by Widal, was followed out, with the exception that the coagulability of the blood, its cryoscopic index, and the blood pressure readings were omitted. Food was omitted by patients to be tested for a period of at least twelve hours preceding the test, with the intention of avoiding any interference with the proper carrying out of the test by the ingestion of nitrogenous foods. A leucocyte count was made, then the subject was given 200 c.c. of milk to drink. The count was then repeated at thirty minute intervals for a period of one and a half hours.

Forty-nine apparently healthy subjects were examined and of these, thirty-nine were pregnant and ten nonpregnant. Six patients showed a four-plus Wassermann and were, at the time, undergoing intensive treatment for syphilis. All stages of pregnancy were represented. In the interpretation of the results of this test it is arbitrarily accepted that a drop of at least 2000 in the leucocyte count

CHART I

FIRST TRIMESTER OF PREGNANCY

NO.	PATIENT	PREGNANCY IN WEEKS	BEFORE PROTEIN	½HOUR AFTER PROTEIN	1 HOUR AFTER PROTEIN	1½ HOURS AFTER PROTEIN	RESULT*
1	M. G.	8	8200	7600	8300	8900	–
2	R. M.	12	7700	6800	6300	5600	–
3	D. C.	12	8850	8650	8500	7100	–
4	R. T.	11	7100	7700	6000	6400	–
5	N. G.	12	8600	7500	10700	9650	A.L.
6	W. D.	11	4600	3200	3300	3000	–

*In all charts: –, means an uninterpreted reaction; +, means a positive reaction or hemoclastic shock; A.L., signifies an alimentary leucocytosis.

CHART II

SECOND TRIMESTER OF PREGNANCY

NO.	PATIENT	PREGNANCY IN WEEKS	BEFORE PROTEIN	½HOUR AFTER PROTEIN	1 HOUR AFTER PROTEIN	1½ HOURS AFTER PROTEIN	RESULT
7.	H. G.	24	7000	9600	7400	5500	A.L.
8.	D. H.	24	5900	5600	8200	5300	A.L.
9.	C. D.	22	4500	6100	4700	5800	–
10.	E. S.	23	6100	6200	4800	5800	–
11.	S. P.	23	6300	4750	5650	5400	–
12.	A. W.	24	14700	16300	13250	14750	A.L.
13.	C. J.	14	5700	5500	6100	6400	–
14.	F. T.	14	6100	7600	6450	6000	–
15.	J. C.	17	4000	4750	4000	3500	–
16.	E. H.	16	9750	1150	11500	10400	A.L.
17.	O. S.	20	6600	8300	4900	5200	–

CHART III

THIRD TRIMESTER OF PREGNANCY

NO.	PATIENT	PREGNANCY IN WEEKS	BEFORE PROTEIN	½HOUR AFTER PROTEIN	1 HOUR AFTER PROTEIN	1½ HOURS AFTER PROTEIN	RESULT
18.	E.G.	28	6200	7600	13200	11000	A.L.
19.	C.J.	34	10450	10500	9900	11500	–
20.	B.B.	30	7600	8700	10500	9300	A.L.
21.	M.M.	32	6500	8100	9000	6750	A.L.
22.	B.W.	34	15900	12500	14400	12000	+
23.	M.G.	28	8200	9000	7500	8100	–
24.	M.E.	32	8700	7400	7150	8100	–
25.	G.H.	26	6700	4400	6450	7600	+
26.	L.R.	36	7300	8300	11500	9600	A.L.
27.	M.D.	34	8300	6600	7500	7500	–
28.	A.C.	29	6300	5700	7200	7000	–
29.	M.H.	26	4600	4850	4350	4750	–
30.	M.W.	28	4500	4300	4100	3750	–
31.	M.H.	28	4500	5300	4100	4000	–
32.	E.L.	36	4750	5400	4100	4850	–
33.	M.C.	36	3500	5850	4100	4500	–
34.	F.J.	28	9600	13300	8300	16300	A.L.
35.	E.M.	34	7750	8100	6100	4800	+
36.	A.T.	30	10500	12500	9100	9000	A.L.
37.	L.E.	28	6450	5200	7000	5300	–
38.	M.H.	28	5500	4550	4300	5200	–
39.	C.R.	32	10075	12200	11000	10800	A.L.

CHART IV

CONTROL GROUP

NO.	PATIENT	PREGNANCY IN WEEKS	BEFORE PROTEIN	½HOUR AFTER PROTEIN	1 HOUR AFTER PROTEIN	1½ HOURS AFTER PROTEIN	RESULT
1.	M.A.	0	8100	9000	9200	8300	–
2.	M.L.	0	12600	7800	11400	7500	+
3.	E.M.	0	9700	7700	8700	10200	+
4.	M.O.	0	4150	5850	4750	4650	–
5.	T.P.	0	5400	9200	6250	5900	A.L.
6.	E.C.	0	4800	8500	6200	5600	A.L.
7.	M.W.	0	5000	5400	4650	5000	–

CHART V

CASES WITH POSITIVE WASSERMANN

NO.	PATIENT	PREGNANCY	BEFORE PROTEIN	½HOUR AFTER PROTEIN	1 HOUR AFTER PROTEIN	1½ HOURS AFTER PROTEIN	RESULTS
I	F.W.	0	11900	5600	4800	7100	+
17.	O.S.	20	6600	8300	4900	5200	–
9.	C.D.	22	4500	6100	4700	5800	–
II	V.G.	0	10600	8300	5900	8100	+
16.	E.H.	16	9750	11500	11500	10400	A.L.
III	L.J.	0	7600	8400	7000	7200	–

occurring within two hours after the ingestion of the foreign protein indicates evidence of hemoclastic shock.

Analysis of the results tabulated in Chart I which represents six average cases of early pregnancy, fails to reveal the presence of a positive reaction. Case 5 shows an alimentary leucocytosis.

Those cases representing the second trimester of pregnancy (eleven in number), also failed to show a single instance of a positive reaction. Cases 7, 8, 12 and 16 showed an alimentary leucocytosis.

Of the twenty-two patients in the third trimester, Cases 22, 25 and 35 showed a positive reaction, while Cases 18, 20, 21, 26, 34, 36 and 39 showed alimentary leucocytosis.

Out of thirty-nine pregnant cases then, there occurred three cases which showed a positive reaction—a percentage of 7.7 per cent. Also twelve cases, or 30.7 per cent showed an alimentary leucocytosis.

The luetic cases, six in number, (three pregnant and three nonpregnant) (Chart V), showed two positive reactions in nonpregnant cases. At the time these tests were performed, these patients were undergoing intensive antisyphilitic treatment.

The control group (Chart IV) included two positive reactions (28.5 per cent) and two cases (28.5 per cent) of alimentary leucocytosis.

Summarizing the results, then, we find that only 7.7 per cent of the pregnant cases showed a positive reaction, while 28.5 per cent of the nonpregnant showed this same reaction. The luetic showed 33 per cent positive in nonpregnants.

SUMMARY

From the evidence presented by Widal and other workers, it is logical to conclude that the normal response to the hemoclastic crisis test is one of leucocytosis, while in the presence of hepatic derangement the response is characterized by a leucopenia. In pregnancy, where the load on all the important organs of the body is increased, one would expect, even in the apparently healthy woman, at least some slight evidence of hepatic derangement.

This is not substantiated by the results obtained from this investigation for out of thirty-nine healthy pregnant women subjected to this test, only three or 7.7 per cent showed a positive reaction; twelve, or 30.7 per cent, showed an alimentary leucocytosis, while the remainder showed a reaction which could not be interpreted. Of passing interest is the occurrence of a hemoclastic crisis in two of the patients who were undergoing intensive luetic treatment at the time the test was performed. This, however, happened to be the only evidence of liver derangement (if any were present at all) that these patients presented.

While the number of cases under consideration here has not been large enough to permit one to decide definitely for or against the value of the test in pregnancy, it is believed that the evidence procured in this series does not warrant the routine use of the hemoclastic test of Widal as a test for liver function in pregnancy.

REFERENCES

[1]Simon, R., and Fontaine, R.: Rev. de chir. Paris, 1923, lxi, p. 637.
[2]Tommaselli A.: Transfusion of Portal Vein Blood, Riforma med,. Naples, July 9, 1923, xxxix, 651.
[3]Delbecq, E.: Leukopenia in Shock, Paris med., Sept. 22, 1923, p. 217-228.
[4]Moutier, F., and Rachet, J.: Hemoclastic Crisis, Progrès méd. Paris, Sept. 22, 1923, p. 469.
[5]Glaser and Buschmann: Changes in Leukocyte Count, Med. Klin., Berlin, Aug. 19-26, 1923, xix, 1144.
[6]Levin, A. L.: Digestive Hemolysis as Test of Liver Function and Influence of Hepatic Extract on It, South. Med. Jour., November, 1923, xvi, 825.
[7]Brown, Thomas R.: Notes on Hemoclastic Crisis as a Test of Liver Function, Ann. Clin. Med., Sept. 1922, i, No. 2, p. 89.
[8]Feinblatt, H. R.: Alimentary Leukocytosis in Eighty Normal Men, Jour. Am. Med. Assn., Mar. 3, 1923, lxxx, No. 9, p. 613.
[9]Kaboth, G.: The Hemoclastic Crisis Test in Pregnancy, Zentralbl. Gynäk., Leipzig, Nov. 25, 1922, xlvi, No. 47, p. 1883.
[10]Mazza and Iraeta: Hemoclastic Crisis in Parturients, Rev. Soc. med. arg., Buenos Aires, December 1922, xxxv, 963.

10 Peterboro Street.

REPORT OF A CASE OF CYLLOSOMA, A RARE FETAL MONSTER

By Samuel A. Wolfe, M.D., Brooklyn, N. Y.

(From the Departments of Obstetrics and Pathology, The Long Island College Hospital)

THE importance of fetal monstrosities lies not only in the study of the pathologic features of the particular specimen but also in the perspective it permits as to growth and development of the normal fetus. It is not the intent to enter into a detailed study of monsters. Yet in a general way double monsters biologically indicate disturbance early in the development of the fertilized ovum. Stockard, experimenting with the eggs of the sea-minnow, produced these forms by reducing the oxygen supply during early cleavage of the fertilized eggs, i.e., just prior to the gastrula stage. Single monsters represent biologically, later developmental defects for "the later the arrest in growth of the embryo, the more limited the variety of deformities, since there are fewer organs in their early rapidly growing primary stages." Among these later defects is failure of closure of the anterior abdominal wall.

Hirst and Piersol group these defects of anterior closure under the general term of celosomia. These are further differentiated as follows:

Apalasoma.—Lateral or median eventration occupying the lower abdomen. The urinary, genital and intestinal systems open by three distinct orifices.

Agenosoma.—Lateral or median eventration occupying chiefly the lower abdomen. The genital and urinary organs are absent or rudimentary.

Cyllosoma.—Lateral eventration occupying chiefly the lower abdomen. There is absence or imperfect development of the lower extremity on the side occupied by the eventration. The sexual and urinary organs are as in the agenosomia.

Schestosoma.—Lateral or median eventration occupying the whole length of the abdomen. The lower extremities are wanting or imperfectly developed. Sex and urinary organs are ill developed.

Pleurosoma.—Lateral eventration involving chiefly the upper abdomen and reaching the anterior chest wall. There is atrophy or imperfect development of the upper extremity on the side held by the eventration.

Celosoma.—Lateral or median eventration with fissure, atrophy, or absence of the sternum and protrusion of heart.

Fig. 1.—Cyllosoma, showing left-sided abdominal fissure, with ectopic liver and intestines, also malformed lower left extremity.

It will be of interest to follow the course of labor in one of these monsters recognized before birth. The gross anatomic description of the monster detailed below permits proper classification as cyllosoma.

Mrs. H. G., a primipara age twenty-four, was admitted by ambulance to the maternity service of The Long Island College Hospital on December 20, 1920. The patient was married one year; the last menstrual period occurred May 4-7, 1924. The pregnancy was uneventful. Labor began prematurely and spontaneously at 5 P. M. on December 20. On admission at 10 P. M. diagnosis of presentation and position could not be made by abdominal palpation. On rectal examination the

cervix could not be distinctly felt. The presenting part felt smooth and moderately firm; anterior to it could be felt smooth regular coils which were interpreted as prolapsed loops of cord.

Vaginal examination showed the cervix 5 cm. dilated, the membranes ruptured. Projecting through the cervix was a cluster of coils, semi-solid in consistency, wider in diameter than the umbilical cord with no pulsation, though the fetal heart could be heard in the left lower abdomen. The loops were delivered externally and recognized as intestinal coils. A smooth mass interpreted as liver lay above and to the left, it was bilobed and was felt suspended by a thin fibrous cord. A breech lay in the midpelvis with back directed to the left. A Pinard maneuver was performed on the frank breech and the anterior leg brought down. With cessation of anesthetic, uterine contractions recurred and a stillborn monster was delivered spontaneously at 2:15 A. M. The placenta was discoid and weighed 520 gm. It measured 11½-x17x2 cm. The fibrous cord was laterally inserted and was 20 cm. in length. The vessels were normal.

Description of External Features of Monster and Autopsy Findings.—The fetus measures 32 cm. in length and is deformed as will be presently described.

Head is relatively large as compared to the body length. The diameters are as follows : S.O.B. 7—B.P. 7½—O.F. 9.5—O.M. 11. Anterior and posterior fontanelles are large; the sutures wide. Contour normal. On opening skull, dura normal. Surface veins of cerebral hemispheres congested. No gross abnormality in mid-brain, cerebellum pons and medulla.

Neck.—Normal Gross contour; thyroid and thymus normal.

Chest.—Well formed and normal contour. Lungs, congenitally and completely atelectatic indicating intrauterine death. Heart weight 20 gm.; normal contour. Muscle wall well developed; valves normal. Foramen ovale still patent.

Abdomen.—The anterior aspect of the abdomen is somewhat obscured by the presence of an ectopic liver and intestinal coils. On lateral displacement the pedicles by which these organs are suspended proceed from an obliquely oval cleft to the left of the midline, reaching the left groin. The upper end begins 4.5 cm. below the xiphoid process. It measures 8 cm. long and 3 cm. wide and the pedicles of the ectopic viscera proceed from the upper angle. The integrity of the right wall is maintained. The cleft is complete and exposes the peritoneal cavity and the retained intraabdominal viscera. No fetal termination of the cord is recognized in the body wall.

The *liver* is of normal size and contour, completely ectopic and conjointly suspended by a broad short peritoneal band. Coronary ligaments are not defined. The portal vessels are easily recognized; the round ligament is well developed and lends further support to the wall.

The *intestinal* loops lie inferior and to the left and terminate in a blind colonic pouch. On further examination the gastrointestinal findings are as follows:

The esophagus is of normal calibre and measures 2.5 cm. in its abdominal portion. The stomach is of normal size, but is rotated upwards (cranially) so that the pylorus is higher than the cardiac end. Fundus is normal. The duodenum is well formed and lies subperitoneally. The opening of the common bile duct and pancreas could not be found. The jejunum consists of five to six extra celomic coils of normal size and contour and terminates in the smaller-diameter ileum. The latter is short and measures only ten cm. before it terminates in the colon at the level of the pelvic brim. The colon proper is represented by a blind pouch occupying the right lower quadrant and communicates with an oval slit in the perineum. There is no indication or remnant of Meckel's diverticulum. No remnant of cecum, ascending, transverse or descending colon is present. The appendix arises from the anterior median surface of the colonic pouch and extends upwards and to the left.

It is 30 mm. long and 3 mm. in width. The gastrohepatic ligament is well formed; the omentum is rudimentary; the mesentery normal.

Liver has been in the main previously described. Because of its extracelomic position the organ has lost its usual topography. A deep furrow across the anterior aspect divides the organ into an upper and lower lobe. At the right end of the furrow the round ligament and ductus venosus emerge and course across the hiatus in intraabdominal insertion. The ductus can be traced to the inferior vena cava. No trace of any bile ducts is found. The gall bladder is absent.

Pancreas occupies its retroperitoneal position and is exposed after some difficulty. The relations to the duodenum are normal. Because of the cranial rotation of the stomach and the rudimentary omentum the relations to the former organ are obscure. Diligent search fails to reveal the presence of the duct of Wirsung.

Kidneys.—The left kidney is lacking. The right kidney is of normal size and contour and measures 4x2.5 cm. The surface shows the usual fetal lobulation. On section cortex and medulla are grossly normal. The ureter is readily traced to the dilated colonic pouch previously noted. No bladder is present. The right suprarenal gland is well differentiated. Left is lacking.

Pelvis is deformed for the left innominate bone is completely lacking as was confirmed by x-ray findings. The perineum too is distorted. Anteriorly no definite sex organs are recognized. The anus is represented by an oblique oval slit 15 mm. long and 4 mm. wide communicating directly with the colonic pouch which evidently forms as yet a common cloaca for the gastrointestinal and urinary tracts. At the left upper border of the perineal sinus arises a small oval nodule about 5 mm. in diameter, at the edges of which are two superficial round bodies with no definite structure. These nodules may be the anlage of the rudimentary sex structures. No intrapelvic sex organs are present.

Extremities.—The shoulder girdle is well formed both arms and forearms are normal. The hands show the following anomalies. Right: only one phalanx is present in the middle, ring and small fingers which are webbed.

Left: the distal phalanx is missing in the ring finger; the two distal phalanges in the small finger. All digits are webbed.

The deformity of the left pelvis has been noted as result of missing innominate bone. The right thigh and leg are normal. The foot shows malformed toes for the phalanges of the four lateral toes are not distinct and are all interwoven. The left extremity is completely deformed. The femur forms a right angle with the vertical axis of the body; an articulating socket of the innominate bone is lacking. The leg is flexed and thinner than its fellow; it articulates at a 45 degree angle with the femur. On x-ray the fibula is lacking. The foot is rudimentary, several of the metatarsal bones are lacking and the anlage of the toes is just discernible.

SUMMARY OF DEFECTS

1. Abdominal fissure on the left side with extracelomic intestine and liver.

2. Malformation of intestine: short ileum, lacking large intestine.

3. Absent pancreatic and bile ducts.

4. Malformed genitourinary tract; missing left kidney; bladder not differentiated from the common cloaca for gastrointestinal and urinary tract.

5. Malformation of skeletal system: webbing of fingers and toes, lacking left innominate bone, left fibula, left metatarsals and left toes. Lacking phalanges in all fingers and in right toes.

In brief, the features presented by this monster are those essentially enumerated above under cyllosoma. The accompanying photograph shows these characters.

REFERENCES

Hirst and Piersol: Human Monstrosities, Atlas. *Ballantyne:* Ante-Natal Pathology. *Stockard, G. R.:* Am. Jour. Anat., January, 1921.

1530 PRESIDENT STREET.

CASE OF ATRESIA OF THE CERVIX*

BY DAVID FEINER, M.D., BROOKLYN, N. Y.

THE case to be reported exhibits an interesting combination of a genital anomaly, uterus subseptus, with atresia of the cervix, associated with delayed puberty and amenorrhea, with ultimate hematometra, and hematosalpinx.

Miss A. B., thirty-five years of age, was first seen by the author, February 1, 1923. Her chief complaint was pain in the left lower quadrant, and amenorrhea. She had had scrofula and Pott's disease as a child. For past two months, patient has been suffering from pain in left lower quadrant, which is not constant; describes same as "feeling a lump in the side." Appetite good, slightly constipated, no nausea or vomiting, no loss of weight or strength. Patient has never menstruated, or experienced any menstrual molimina. Physical examination revealed a rather slim, anemic-looking, adult female patient; skin wrinkled and parchment like. Neck showed scars of old healed scrofulous glands. Chest considerably deformed, with marked kyphosis. Breasts were thin, flat, and poorly developed. Cardiac auscultation revealed a harsh, systolic murmur, heard at the apex, and transmitted to the axilla; muscular quality of sounds, fair. Abdomen, negative.

Vaginal introitus admitted one finger with difficulty; no external signs of infection were visible. The cervix was represented by a dimple in the vault of the vagina, and showed no evidence of endocervicitis. The uterus appeared normal in size and position, but was extremely sensitive on palpation. In the left pelvis could be palpated a soft cystic mass, the size of a tangerine orange.

The patient disappeared from observation for period of one month, and then again consulted the writer, for the same complaints of pain over the left lower quadrant, and, in addition, over the hypogastric region. A vaginal examination showed the left-sided mass still present, and slightly increased in size.

The patient was admitted to the Beth Moses Hospital, March 4, service of Dr. H. Vineberg, with diagnosis of ovarian cyst, or tuberculosis of adnexa.

At operation, the abdomen was entered by a median incision. The uterus appeared moderately enlarged and distended, and suggested retention of blood; the left tube was dilated to the diameter of 4 cm., sealed at the fimbriated end, reddish in color, and appeared to contain blood; the right tube was slightly distended, and similar in appearance. Both ovaries were apparently normal. A vertical incision in the anterior wall of the uterus opened into a hematometra, and exposed an anteroposterior vertical septum, dividing the organ into two

*Presented at a meeting of the Brooklyn Gynecological Society, May, 1924.

separate cavities, with a small communicating opening in the upper limit of the partition. There was also an atresia of the cervix, the entire canal being replaced by a block of fibrous tissue, which was so dense as to defeat an attempt to pass a probe, from above, down through the canal, and into the vagina.

After the excision of the uterine septum, the following procedure was adopted in an attempt to establish a permeable cervical canal. The bladder was separated from the uterus, and the entire length of the cervix exposed; the cervicovaginal junction divided, and the external os brought into view; a small, transverse incision was then made across the midpoint of the anterior surface of the

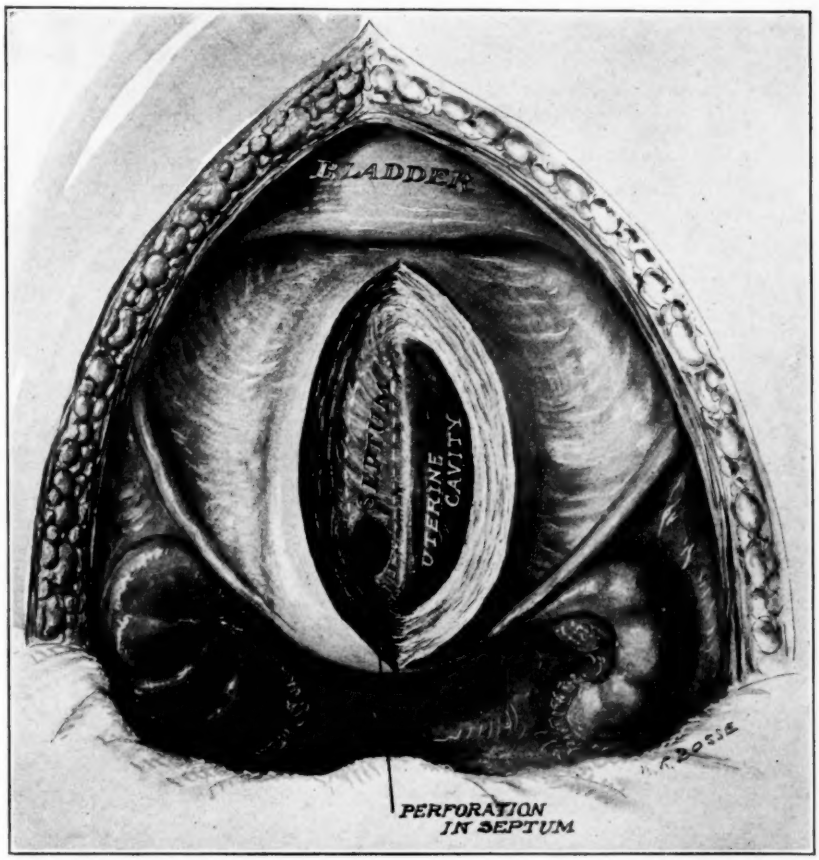


Fig. 1.—Uterus opened, showing septum with perforation, bilateral hematosalpinx.

cervix, and a probe forced down from above, through the internal os, to this point, and a second probe passed in a similar manner, from below, through the external os, and upward to reach the same midpoint, thus establishing the patency of the canal. The incision in the cervix was sutured, the cervicovaginal junction restored, the bladder replaced, and the uterine incision closed. A salpingostomy was done to permit the escape of blood from the hematosalpinx. An iodoform pack was left in the newly constructed cervical canal.

This type of genital anomaly, usually termed uterus subseptus, is the result of failure of absorption of the inner wall of the müllerian

ducts. The atresia of the cervix, theoretically at least, may be due to lack of canalization of the ducts of Müller, in one localized spot, or to adhesions of the cervical canal between opposing epithelial surfaces, or to cicatricial union following upon endocervicitis of an infectious origin dating back to fetal life or period of childhood.* The entire picture of the underdeveloped rudimentary uterus, with delayed

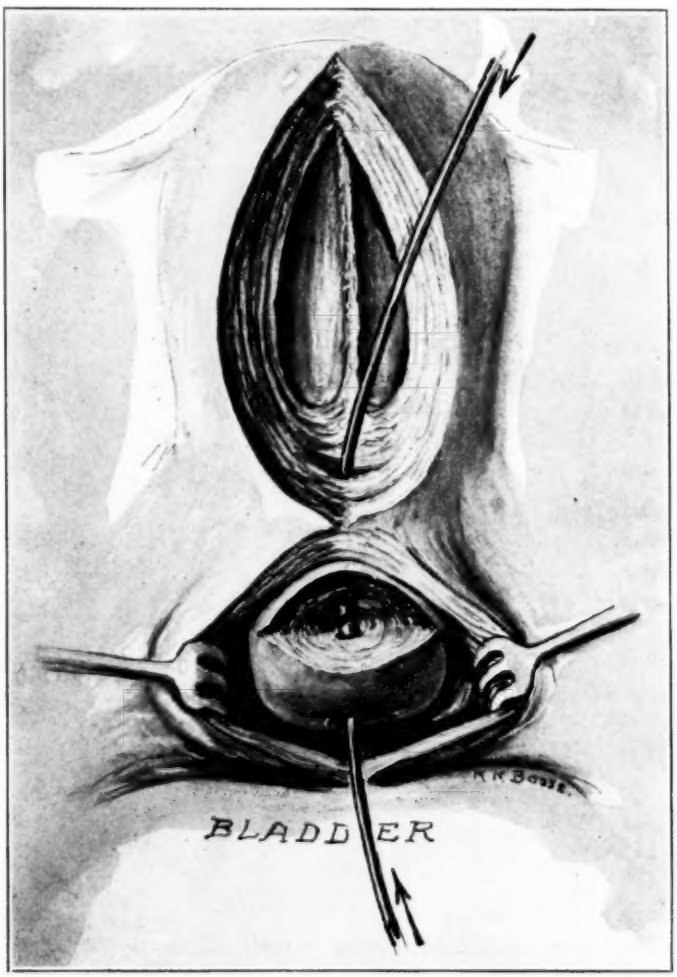


Fig. 2.—Showing operative procedure. Uterus opened, partition removed, bladder retracted, cervix exposed, probe passed.

puberty, represents the result of an insufficiency of the ovarian function, together with a hypofunction of the thyroid or pituitary gland, or both. In this case, although the ovaries appeared macroscopically normal, it would be impossible to judge as to their functional activity without a histologic examination.

*Eden and Lockyer, System of Gynecology, I, 251.

Of considerable interest is the fact that this patient, in spite of this marked genital anomaly, suffered no discomfort from the same, up to the present period, and then, judging from her clinical history, as a result of an awakening of her internal glands at this unusually late date, she began to menstruate with the foregoing result.

The postoperative course was uneventful, the patient leaving the hospital on the twelfth day. The subsequent therapy consisted of hypodermic injections of ovarian residue and pituitary gland with thyroid gland by mouth. The cervical canal has been dilated at periodic intervals and permits the introduction of a sound without difficulty.

The patient menstruated six weeks postoperative; since then there has been a repetition of the same every five to six weeks for one day. The psychologic effect of the anticipation of this periodic flow has transformed this young woman from a dull, apathetic individual, into one who is bright, alert, happy, and looking for a husband.

875 St. Marks Avenue.

Society Transactions

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

THIRTY-SEVENTH ANNUAL MEETING

CLEVELAND, OHIO, SEPTEMBER 18-20, 1924.

(Continued from March)

DR. WILLIAM SHARPE AND DR. A. S. MACLAIRE, New York, N. Y., presented a paper entitled **Intracranial Hemorrhage in the Newborn.** (For original article, see page 452.)

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, N. Y.—I would like to say something about the delivery of the aftercoming head in this connection and the advisability of slowness in extraction. These aftercoming heads come down under pressure. If they come down quickly that pressure is suddenly released, consequently, the delicate membranes are torn and you are more apt to have hemorrhage than when the extraction is slow and there is no spring as in the sudden extraction. That is why we advocate the utmost care and deliberation in the delivery of the aftercoming head.

DR. JAMES E. DAVIS, DETROIT, MICH.—I had hoped that the essayist would have said more about the nontraumatic hemorrhages. Quite generally nontraumatic hemorrhages are not thought of. It is not expected that there are very many such types of hemorrhages. We will remember that the neonatal death rate has not been changed perhaps in about 30 years, and I am thoroughly convinced that a study like this and other studies of the same character will do very much toward helping in lowering the maternal and neonatal death rates. It is most astonishing in doing a large number of autopsies upon subjects of the neonatal period to find there is very little evidence upon which to base a diagnosis for the cause of death. But if the autopsy is done carefully enough, one will frequently find in various parts of the body that there are hemorrhages, sometimes so slight as to be entirely overlooked, but with those slight hemorrhages one will find edema, especially of the brain, as mentioned by the essayist.

I am thoroughly convinced this wet brain is the end-result that produces death in many of these cases. It is also noticeable in some of these cases, that there is a slight jaundice, and with that slight jaundice an edema, and in such cases a most thorough search should be made for the more minute hemorrhages.

I am very sure the points that have been made, especially in regard to pathology, are entirely correct. I have proved those points over and over again. I believe we are in the habit of neglecting to do autopsies upon this kind of material, where the permit for an autopsy is comparatively easy to obtain. The most painstaking care is necessary to determine such changes.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PA.—The obstetrician notes the convulsed or sluggish and somnolent newborn child and may determine intrathecal hemorrhage and dangerous intracranial pressure by the spinal manometer,—an easy and simple procedure in the infant. Blood in the cerebrospinal fluid remains fluid for days and if excessive pressure is unrelieved, Dr. Sharpe believes that deposits occur along the pial vessels obstructing the absorption of the cerebrospinal fluid and causing permanent cerebral injury. With excessive pressure immediately after birth, repeated punctures are made until the pressure falls and remains near the normal point. In the occasional case only, I believe does Dr. Sharpe find the puncture insufficient and a decompressive craniotomy necessary. Later, he considers that the time for prophylaxis has passed and the child is now fortunate if its condition can be improved by a craniotomy or other operation. If this be true, the diagnosis and early treatment, which is most important, must rest largely with the obstetrician; and neglect in these early days may doom the child to permanent invalidism.

DR. EDWARD SPEIDEL, LOUISVILLE, KY.—In the matter of not increasing a slight hemorrhage already existing, it should be evident to all of us that asphyxia on the part of the baby is an indication of such hemorrhage, and that no violent procedures should be used in resuscitation of such a baby. The maneuvers shown by Potter in his method of resuscitation are more than sufficient under all circumstances. Hanging the baby down by the head, slapping it, and especially swinging it, will increase the asphyxiation, and in consequence will increase the cerebral hemorrhage.

DR. SHARPE.—In regard to the best type of autopsy incision so the brain will not be damaged, we are using the separation of the suture ring and incising it low on each side so it is possible to remove the dura and make a careful examination of the sinuses, and also to ascertain the probable cause of the hemorrhage.

We are not performing any cranial operations, merely the lumbar punctures.

The point brought out in regard to supratemporal hemorrhages, is an idea which has been handed along for many years, namely, that a supratemporal hemorrhage, or supraarachnoid or subarachnoid, does not get down into the spinal canal, and yet, in adults, in a large series of cases, now and then the hemorrhages does pass to the canal. In children, it does reach the spinal canal, particularly if it is subarachnoid. That is the usual manner of flow of the cerebral spinal fluid coming out through the posterior side, over the surface of the brain, and down into the spinal canal. As to the best operation, I prefer the cranial drainage for the extreme cases where this might be indicated, using merely modified subtemporal drainage, whereby a little vertical incision along the suture line is made with the scalpel, and then a portion of the bone is removed for a little over an inch in diameter, the dura is opened, and direct drainage permitted. But those are the ones only where the spinal drainage fails.

DR. G. VAN AMBER BROWN, Detroit, Mich., read a paper entitled **Appendicitis in Children.** (For original article, see page 463.)

DISCUSSION

DR. WILLIAM E. DARNALL, ATLANTIC CITY, N. J.—We should not regard appendicitis in very young children from the same standpoint that we do in the adult.

Appendicitis in children may come on very quickly, but sometimes it does not. I remember a case some years ago in which a little boy of nine got up in

the morning feeling perfectly well, took a surf bath, ate a hearty dinner, and hadn't a single symptom up to three o'clock, when he was seized with violent pain. At eight o'clock he was operated on, and by this time he had at least a gill of pus and a ruptured appendix. It is said that appendicitis rarely occurs in children under two; the youngest case in my series was twenty months old. In some of these very young cases, however, the symptoms come on very slowly and sometimes they are several days working up to definite symptoms which you can say are indicative of appendicitis.

I operated on a boy of six who had been sick a week and had been running a temperature all that time, but there was nothing very definite. He was in the hands of a very excellent and able man, and a good diagnostician, but he could not make up his mind until several days ago that the boy had appendicitis, and not then until he developed 24,000 leucocytes.

I have seen a number of these cases in very small children of two or three years, in whom the symptoms came on very slowly and it took several days before you could say positively the child had appendicitis.

Another thing about appendicitis in children is that a child cannot readily locate pain. Again when these appendices do go bad, you do not get that wall of lymph adhesion which you find in the adult. When the abdomen is opened you find a little puddle of pus down in the right iliac fossa; there is no attempt of Nature to wall off the pus, and there is usually a beginning peritonitis.

As to diagnosis of appendicitis in children it is difficult from several standpoints. Most all of the gastrointestinal troubles of children have certain features that may simulate the pain and tenderness of appendicitis.

When you attempt to examine a young child he is scared; he has some pain, and is crying, and how are you going to tell whether a crying child has rigidity of the muscles or not?

PROFESSOR OSKAR FRANKL, VIENNA, AUSTRIA.—The problem of appendicitis in children is not only interesting to the surgeon but is also to the gynecologist. We see many cases of sterility without any apparent reason. A woman was virginal when she married, but she is sterile. When we examine such a case we find a chronic periovaritis, as a rule, and abdominal lesions, and here and there we find the fallopian tubes closed. I studied this subject 19 years ago in a dispensary in one of the hospitals of Vienna, and examined many children. I am convinced a good many cases of sterility with unknown etiology are nothing other than the consequence of appendicitis in childhood. Surgical treatment in these cases is certainly to be preferred to conservative treatment. Those cases which show several recurrences and are treated conservatively, later develop an appendicitis which may lead to chronic pelvic peritonitis and later to sterility.

DR. LOUIS FRANK, LOUISVILLE, KY.—I think the essayist has not made himself exactly clear, and in these papers, we should draw distinctions. We speak of operation as soon as we see a case. Do we mean as soon as diagnosed by the attendant, or when the surgeon first sees it or in the first day of the disease? Now, I think the time factor is the most important factor in the treatment of appendicitis. We all agree they should be operated early, if diagnosed immediately, but so often the surgeons do not see these cases until two, three, four, or five days have elapsed, and I believe that here operation means tremendously high mortality.

I would further say that I believe there is no man here who has operated on a case in which there was absence of intestinal peristalsis. We consider this one of the most important indications as to what we should not do with these

patients. I belong, probably, to the older school, the "Ochsner School," when it comes to the treatment of appendicitis. We don't operate all of our cases immediately we see them by a great majority, and yet, we have a fairly low mortality.

Also when we speak of a general mortality, of 11 to 15 per cent, I think it is misleading, because that takes in a great group of general hospitals and does not take in any one individual's work. We find in the general hospitals where many men are doing work under different circumstances the mortality always runs high.

I think if Dr. Brown will analyze his paper and group the cases with abscesses in which he attempted removal of the appendix, the patient having been ill five, six, and seven days when they came to him, thus comparing a time operation with exact pathologic findings, he will find there will be quite a different interpretation put upon his mortality, and it will work out quite differently.

To search for the appendix in abscessed cases is to record disaster. We simply let the pus out and later take the appendix out. Our experience has been that children very commonly show pelvic abscesses. We have seen them rupture through the bowel a number of times during the period we have been giving our conservative waiting treatment. Probably when the operation was set they would pass pus out through the rectum. We have seen very few recurrences where this has ensued and where the abscess had perforated through the large bowel, or where we have perforated them intentionally by the external iliac fossa route by operation.

The diagnosis in young children is not always comparatively easy. Our great difficulty has been, we believe, not that so many cases have been overlooked, but that cases that are not appendicitis are so diagnosed and operated on. We have seen repeatedly, cases of early central pneumonia, not only in children, but adults, especially when beginning about the diaphragm, operated upon and the appendix removed. Later the diagnosis of the case was cleared up. We have thus avoided operation in a number of cases. It is a point to be remembered also, in children diaphragmatic pleurisy may closely simulate appendicitis.

Another point in the diagnosis which we think should not be overlooked, though it may make no practical difference as Dr. Brown says, is Meckel's diverticulum. We have seen in early operation within the first twelve or fourteen hours, thrombosis of the mesenteric artery diagnosed as appendicitis.

I believe this Society should attempt to teach the slogan to every mother,—"No purgation for belly-ache." That is the worst thing they can do. I have never seen a case of perforation where a purgative had not been administered. Every one who had purgatives had perforation, and vice versa.

DR. WALTER C. G. KIRCHNER, ST. LOUIS, MO.—Dr. Brown has very properly called attention to the differences in the treatment and handling of cases of appendicitis in children and those of the adult. The diagnosis is extremely difficult at times in children, and I want to accentuate the point he made in examining the entire child. To an audience of this sort it seems perhaps superfluous to call attention to this particular point, but cases are referred in which the general practitioner has made up his mind and refers the case as one of appendicitis.

I want to call attention to a very glaring mistake of that sort. A little girl was received in the hospital with the diagnosis of appendicitis, because when the abdomen was touched the child cried as if in pain. The family physician as well as all the internes had diagnosed this case as appendicitis, but at my examination there was something peculiar about that case that warranted further investigation. So a complete systematic examination was made, in the course

of which I removed a dead fly from the ear canal. The "appendicitis" thus was cured.

Now, how are we going to make a diagnosis in some of these indefinite cases? The Doctor mentioned that it is very difficult to localize an area of tenderness. In those very uncertain cases, when an anesthetic is given and the patient is merely benumbed, then the localized pain becomes evident when careful examination of the abdomen is made. Morphine should never be given when the diagnosis is uncertain and operation is not contemplated, but here too, when the patient is benumbed, the sensitive areas come to play, and in that way you sometimes accentuate localized areas where otherwise it would be impossible.

The location of the appendix in children varies as it does in the adult. If the appendix lies to the outer side of the cecum the diagnosis usually is much easier and the prognosis is more favorable, but in many instances it is to the left of the cecum. The latter cases are the dangerous ones and increase the mortality if perforation occurs. Those are the cases also which are covered by the intestines, and when we press the abdomen we get no rigidity, and such cases are allowed to go for several days without proper attention. Then, as a point of diagnosis, if the abscess or inflamed appendix is retrocecal, you press firmly on the abdomen and then have the child flex its thigh, the contraction of the psoas muscle will cause pressure from behind, and then pain will be elicited. That is an indication very often of a deep-seated abscess.

The leucocyte count is of great value in the early stage, but later on it may be of less value, because the leucocytes are pouring into the abscess and the count may approximate the normal.

Another point that is of value in certain types of cases, especially in retrocecal abscess, is a careful examination of the urine, especially of children. In a few instances pus was found in the urine. That confuses the diagnosis, but if you find pus in the urine and you get this deep-seated pain when pressure is made from above and the thighs are flexed, then there may be an abscess associated with the ureter. If you then drain this abscess and remove the appendix, the pus in the urine will clear up.

Diverticulitis has been mentioned, but it is not unusual, at least in my experience, that we occasionally find the so-called Lane kink the cause of certain indefinite symptoms of appendicitis. If then upon operation you find an appendix that is apparently normal, follow up the small bowel for a short distance, and you may find this kink, which should then be removed.

The location of the incision is very important. If the abscess is localized to the outer side of the cecum, then we ought to incise in that region; if it is to the inner side, of course, the right rectus incision might be done. But the pendulum is swinging back to the McBurney incision. Many operators, favoring the right rectus incision, are obliged to drag a filthy appendix from its location on the right side into the free abdominal cavity and thus contaminate a great part of the abdominal cavity. As Cleland mentioned, in many general hospitals, the interne gets the impression that the right rectus incision is the proper thing. If the visiting doctor can't get to the hospital perhaps the interne does the work and having made the right rectus incision, slops the appendix into the peritoneal cavity with fatal results and increases the mortality.

In the critical cases I believe the incision should be made where we expect to find pus, without regard to whether a hernia results or not. In regard to appendicitis in girls the point was well made that we want to avoid infections of the pelvis. Therefore, as soon as possible do early operations to avoid serious consequences and to obviate adhesions in the pelvis. When we do find pus, we

should not be satisfied with drainage merely around the appendix area, since very frequently we will find more pus in the pelvis.

DR. H. O. PANTZER, INDIANAPOLIS, IND.—Let us consider what is back of appendicitis. The anatomically normal appendix, even when the seat of subacute inflammation is rarely menacing to life. But anatomic irregularities in the appendix and the adjacent colon and ileum are potential factors for the development of disease. Where such are revealed in the adult, the evidence of their previous existence is easily obtained. I have taken the pains to question the mothers of such adults and 19 times out of 20 I was told that, as infants, they cried a great deal, even beginning the first day. In time Nature develops a tolerance for such conditions and they become less obvious: but, yet they constitute a locus minoris resistentiae, and at times of systemic disease with bacteremia, become infected.

With such an etiologic factor in mind, I not only plead for early operation, but for an *earlier* operation. In other words, instead of carelessly charging the crying of infants to mother's milk, to seek in these cases for anatomic irregularities, and where found operate.

Another point I will make pertains to palpation. We must be taught to palpate as do the blind. It is truly surprising what correct method of palpation reveals in abdominal cases. It is more than Roentgen rays show. It reveals the position, form, size and relation of organs in a surprising degree, and tenderness—most definitely—even when only of moderate degree.

DR. ROBERT T. MORRIS, NEW YORK CITY.—In children, an important point in differentiation in diagnosis is this: the appendix acutely inflamed will irritate the psoas muscle. A child tossing about in bed or resting quietly will have the right leg flexed more than the left most of the time on that account.

Dr. Brown found chronic appendicitis more frequent in women than in men. I would ask Dr. Brown in his next series of cases to note if these women have narrow costal angles, short sternums, and other stigmata of decline. In the course of racial physical decline the stigmata appear in women first. Early involution of the appendix belongs in this category.

I am very much in favor of the Ochsner starvation treatment and the Alonzo Clark opium treatment, but they must be applied in the right way.

I quite agree with Dr. Frank that it is important for us to report the statistics of the individual surgeon rather than those of a hospital. At one of the hospitals in New York where there is a great deal of emergency work, the death rate after operations for acute appendicitis had been 31 per cent, until L. W. Hotchkiss suddenly switched over from the third era principle to the fourth era principle. They had a run of 76 consecutive cases without a death in the same class of cases that had previously given a 31 per cent death rate.

DR. KING, CLEVELAND, O.—I would like to cite two cases of acute tonsillitis in the past two years where the mother called me in to operate on the child for appendicitis. All the symptoms and all the signs pointed to acute appendicitis. There was nausea, vomiting, and pain in the right lower side, accompanied in one case by diarrhea, in the other by the vomiting of blood. Both these cases on examination presented every sign required to diagnose acute appendicitis, and yet, I thought there was something else I ought to look for, and I thought inasmuch as the mother did not say anything about the child's throat it might be well enough to look at the throat, and in both cases the tonsils were swollen, enlarged, and filled with pus. The pain and tenderness in the lower abdomen

entirely subsided on the third day. That is analogous to the time when the temperature subsided from the tonsillitis.

I would like to ask Dr. Brown if, in his experience, he has found any cases wherein acute tonsillitis was present that later on he had to take out an appendix.

DR. J. F. BALDWIN, COLUMBUS, O.—Dr. Brown stated that in a hundred per cent of his cases there was pain. I would modify that statement by a fraction of a per cent. I shall never forget a case which I saw about 11 P. M. in the practice of one of the best physicians in Columbus, always alert for appendicitis, particularly in children. He had been watching this patient for forty-eight hours, a boy about ten years old. It was Christmas time, and the boy had been skating that afternoon on the sleet-covered street, but he did not feel entirely well. There was no pain, however, no vomiting, no nausea until about an hour before I saw him. The doctor had seen him two or three times during the day but could make out only a little diffused tenderness over the abdomen. No constipation. We went over that boy very conscientiously and very carefully but all that we could find was a facial expression that we did not like. On the strength of the abdominal discomfort and the facies we advised operation. If the parents had objected we could not have had an argument to present, but they left the matter entirely in our hands. An hour later on making the incision I found a ruptured gangrenous appendix and the pus simply poured out. Drainage was inserted and there was prompt recovery, but there had been no pain.

DR. BROWN, (closing).—The three points that I tried to bring out in my paper are, first, the importance of making an early diagnosis; second, the high mortality rate; third, the great danger that comes from giving a cathartic.

In the case Dr. Baldwin spoke of, the child that did not have pain, I can readily understand how the onset could be so rapid and the toxemia so pronounced that the patient might not develop the symptom pain. May I also suggest that I might, and did, modify in my paper the statement that there was vomiting in 100 per cent of the cases. I said there were out of 103 children, two that did not vomit, they were chronic cases. The first symptom was pain, and in 100 per cent of the acute cases, pain was soon followed by the second symptom, vomiting and nausea. The tenderness on pressure was present in 80 per cent of the cases.

Dr. Kirchner stated that I hadn't emphasized the importance of differential diagnosis in pyelitis. I am at a loss to know how I could have emphasized it more, when I stated that the symptoms are so like those of appendicitis that they frequently baffled the diagnostic acumen of the most skillful and learned surgeons, and that we studied the urine in all our cases. It just so happened there were only two out of the 103 that had albumin in their urine.

Palpation done as suggested by Dr. Pantzer should be emphasized. He said we should palpate as a blind man palpates. I always tell my internes that they should learn to palpate affectionately, just as affectionately as they know how. That is the way to palpate, not with the tips of the fingers, but with the whole hand, pressing the palm of the hand on the surface at, or near, the area of the lesion and then one can readily detect the slightest rigidity or definitely outline the area of tenderness, when he cannot by going at it roughly and using the points of the fingers, as is too frequently practiced.

Dr. Frank suggested that we should study cases as individuals and not as coming from general hospitals, because with the former the mortality runs higher. I am not so sure that is true. The cases reported from the Mayo Clinic, ran 47 per cent mortality in children of five years and younger.

Dr. Darnall raised the question of how early in youth we might expect to find

appendicitis. A case is reported in the literature very recently of a baby that was born with an abdominal mass. The attending physicians were at a loss to know what was the trouble; inside of the first 24 hours of the baby's life it was operated upon, an enlarged, inflamed, and distended appendix was discovered and removed. So, appendicitis may occur at any time in life.

Now in reference to it being hard to detect pain and locate tenderness in the crying baby, this may be because surgeons haven't tact in handling children. If there is any doubt as to diagnosis, call in a pediatrician who is used to handling those little ones, he can very frequently get them to stop crying, and will be a great aid to us in the diagnosis.

Concerning McBurney's incision, it does not very often have a place in the surgery of appendicitis in children, because the appendix in the first four years, and possibly later, up to eight years, and occasionally even later than that, is high up in the right side, and by making an incision over McBurney's point, it just gets you into trouble, because the incision is not over the appendix. You should, as I stated, find out where the appendix is located, this can be done by eliciting the greatest point of tenderness which is always over the appendix. In children the appendix frequently is in an abdominal position, so you have to make the incision to suit the case.

DR. W. WAYNE BABCOCK, Philadelphia, Pa., presented a paper entitled **The Field of Partial Gastroenterostomy in the Treatment of Ulceration of the Stomach.** (For original article, see page 473.)

DISCUSSION

DR. HUGO O. PANTZER, INDIANAPOLIS, IND.—I can fully endorse the final conclusions, although my operation is one much simpler than that proposed by the essayist. I aim to establish normal relations, nearly as possible. In other words, I still do Billroth's duodenogastrostomy; very rarely a jejunogastrostomy.

The etiologic anatomic irregularity back of practically all of these cases, and more particularly that known as incomplete rotation of the intestines, is admirably described in the late edition of Cunningham's Anatomy. Let me cite a case in instance. A woman, aged 52, was brought to Indianapolis on a stretcher having complete stenosis of the pylorus, verified by X-ray pictures taken at her home, which also showed a barium test-meal retained in the stomach after 48 hours. These pictures, and even more, my palpatory examination of the abdomen revealed a stomach hanging by the pyloric end high and to the left of the median line, and its distended body reaching into the pelvis; the ascending colon in its entirety lay about two inches inward of the right lateral abdominal wall; the liver lay to the left and then aslant downward to the right. The patient, who is the mother of four robust sons, had suffered off and on through her life, gastric disturbances, which lately developed into acute attacks of gastric pain and hemorrhage. Gastric ulcer had been diagnosed long ago, and more latterly, cancer was mooted. Patient now weighed 80 lbs., having lost 60 lbs. My operation was done after six days of preparation, which included rectal feeding. The gastroduodenal parts, high up, were acutely angulated by congenital peritoneal bands, and were involved in adhesions. After freeing the latter, the congenital bands were cut so as to liberate the stomach and duodenum from their high attachment and acute angulation. The duodenum was much thickened and friable, detaching itself from the stomach almost without the necessity of cutting. The pyloric opening was carefully closed, and the duodenum was implanted into the anterior gastric wall: crosswise to the circular fibres of the pyloric end so

as to insure a permanent opening. The patient made a good surgical recovery, and was put on soft diet after one week, and on full diet shortly later. It is now two years after the operation and the patient enjoys weight, health and vigor.

One point I would emphasize, namely, that in the literature upon gastric and duodenal ulcers, there is little reference to the etiologic significance of anatomic irregularities, and as a consequence, in the operation for ulcers, these are not sought out and corrected. In some instances, where the ulcer found at operation showed but moderate thickening of the adjacent tissues, I disregarded the ulcer, and only corrected the angulation, torsion and distraction caused by peritoneal bands, and gave full relief to my patient.

DR. GEORGE VAN AMBER BROWN, DETROIT, MICH.—The physiologists have shown that the acid-secreting portion of the stomach is in the greater curvature near the esophagus. They have also called attention to the fact that the hormone area is in the lesser curvature near the pylorus. Therefore, it would seem to me that, in doing a gastrectomy these physiologic truths should be born in mind by the operator, and the greater portion of the lesser curvature removed, changing thereby the chemistry of the gastric content through removal of the hormone-bearing area, and thus lessening the acid secretion.

DR. CHAS. G. HAYD, NEW YORK.—As I listened to Dr. Babcock it appeared to me that he begins with the thesis that gastroenterostomy is associated with considerable dissatisfaction. Furthermore, that out of 100 persons who are submitted to gastroenterostomy two die, twelve are not cured and three to four suffer from the subsequent development of marginal ulcer, with a secondary operation. It would appear then that at least 86 per cent are cured.

In following this argument we are confronted with two diametrically opposed opinions as to what surgical procedure to employ in gastroduodenal ulceration. The continental surgeons believe in ultraradicalism with resection. The American surgeons tend to more conservative procedures with or without local treatment to the ulcer plus gastroenterostomy. I think it is axiomatic that any operation that unites the stomach to the duodenum below the ampulla of Vater is essentially unphysiologic. Are we not, however, dealing with a larger problem than the mere ulcer? Are we not concerned with the larger problem of the ulcer-bearing tissue rather than the ulcer *per se?* Therefore, it is most desirable that any operation that may be contemplated shall have for its object the union of the duodenum to the gastric segment, this procedure being the most physiologic type of reconstructive surgery that is possible. However, before recommending the more radical types of gastroduodenal surgery may we not reasonably ask the following questions: (1) What is the expected mortality after resection? (2) What is the associated gastric morbidity after resection? (3) What is the degree of contiguous disease of the gall bladder? (4) What measures are to be carried out for the relief of other points of chronic focal infection within the abdomen? and, (5) the necessity of dietary regulation of the patient after resection.

If we take a large clinic, such as the Mayo Clinic, with a single, isolated group of surgeons of known competency and carrying out a form of technic that is relatively constant, we may derive an answer to the possibilities of gastroenterostomy as a curative measure in duodenal ulcer. We can put to ourselves this question, "I have an ulcer of the duodenum and I will have gastroenterostomy performed; I stand an 84 per cent chance of being entirely well; I take a 2 per cent chance of dying and a 4 per cent of marginal ulcer." The answer to that question is, after all, the answer to the problem presented by Dr. Babcock's paper.

On the other hand, I hesitate to contemplate the possibilities of harm and the resultant mortalities if every individual surgeon in every town and hamlet in this country is going to begin doing resections of the pyloric segment for ulcer. In listening to Dr. Babcock's paper I was impressed with the personal viewpoint of the essayist and particularly at his philosophy derived from a critical survey of his own gastric surgery both from the technical point of view and also with regard to the future of his patients.

DR. H. W. HEWITT, DETROIT, MICH.—I think most of us will agree with Dr. Babcock on the necessity of removal of gastric ulcers, and especially a large gastric ulcer. There may be some discussion upon the question of whether we will resect the ulcer or whether we will do a sleeve resection. We all know a gastric ulcer is a source of potential malignancy. On the other hand, a duodenal ulcer very rarely becomes malignant.

Now, the point I wish to make is this—gastroenterostomy properly done is a simple procedure. It has a low mortality, as Hayd has mentioned, and if done properly the results are good in 85 per cent of the cases. Now, if I were to be operated on, I would not want to have a large part of my healthy stomach cut away by gastrectomy for a simple duodenal ulcer; I would much prefer, if the ulcer happened to be on the anterior side of the duodenum, to have that removed.

DR. BABCOCK.—Gastroenterostomy gives fair results for duodenal ulcer with 82 to 92 per cent of the patients classed as satisfactory after the operation. Much depends on our interpretation of the word satisfactory. The other day, one of my "satisfactory" patients had a fatal perforation eleven years after excision of a duodenal ulcer and a Finney operation.

If the results from gastroenterostomy for duodenal ulcer are fair, for gastric ulcer they are poor. Sixty-two to eighty-six per cent of the cases are classed as satisfactory according to the personal interpretation.

Partial gastrectomy is often a difficult and time-consuming operation. It is not, as has been said, an operation for the tyro in surgery. Yet, I am resolved that as long as it continues to give as low a mortality as gastroenterostomy and far better late results, I shall employ it where possible for gastric ulcer and for the more obstinate types of duodenal ulcer.

DR. ROBERT T. MORRIS, New York, N. Y., presented a series of charts illustrating **Sympathetic Ganglion Points in Differential Diagnosis in Certain Abdominal Conditions.** (For original article, see page 486.)

DISCUSSION

DR. MILES F. PORTER, FT. WAYNE, IND.—Really, I have had very little experience with these points that Dr. Morris has brought out and which I have heard him explain before. I find a good deal of difference of opinion among men who write on the subject of diagnosis as to the value of these various points that have been brought out by Dr. Morris. But certain it is that if these points of diagnosis prove to be as valuable as Dr. Morris has found them, they will result in preventing a good many unnecessary operations. I am free to confess that the results of my operations, my own personal operations, for chronic appendicitis have not been extremely satisfactory. I mean to say by that, in my own personal experience I have operated on a number of cases in which we failed to get the relief that we hoped to get from the removal of the appendix, notwithstanding the fact that the appendices removed at those operations gave, according to the laboratory report, evidence of the fact that the diagnosis was cor-

rect, that is to say, we were dealing with chronic inflammation in the tissues of the appendix. I could wish that we might have some diagnostic points as reliable as Dr. Morris seems to think these are in their relation to chronic appendicitis that would help in the differentiation of the various more or less acute processes that occur in the right side of the abdomen, and especially those frequently referred to as peritonism. I believe there are cases of real pneumococcic peritonitis that arise in children especially, in connection with pulmonary infections, and also some of those peculiar cases that arise in connection with acute lesions of the throat.

DR. W. WAYNE BABCOCK, PHILADELPHIA, PA.—The work done in relation to the sympathetic system brings up the question as to how much we should do, or may do, to relieve our patients by operating upon the sympathetic ganglia in the abdomen. I should like to ask Dr. Morris what his feeling is in this regard, for there now comes from Australia the suggestion that we may relieve the spasticity of paralysis agitans or other conditions by removing the sympathetic ganglia in the abdomen.

I have at the present time a patient in a hospital who was operated on about a month ago for Parkinson's disease in very aggravated form. Stimulated by Royle and Hunter, we first removed the sympathetic ganglia from the right neck and obtained the characteristic myosis, exophthalmos and skin reaction. After the operation, as the tremor of the hands seemed less, we were encouraged and a week later through a low, right, oblique abdominal incision we exposed the lower, right abdominal ganglia behind the peritoneum. I was interested to find that, although this woman was rather stout, it was not difficut to strip the peritoneum to the mid-line and expose the aorta and the lower, right sympathetic ganglia and their communicating rami. It was difficult, however, with the incision, which differed from that of Royle, to expose the sympathetic above the lower level of the kidney. While the leg seemed a bit better temporarily, at the present time the patient is just as badly off as she was before these two operations.

DR. FRANCIS REDER, ST. LOUIS, MO.—Some few years ago I presented before this Society a paper, the title of which I called, "Pre-Menstrual Appendicitis."

It has always been a clouded evidence as far as my reasoning was concerned why a woman should have such severe pains in her right iliac organ and only a mild discomfort in her left several days before her menstruation. I tried to attribute it to a cystic right ovary, the clinical picture, however, was so distinctive of an appendix lesion that in the more severe cases an operation was suggested. In those cases when the operative measure had been accepted, a chronically diseased appendix, frequently with adhesions, with the organ placed retrocecally was found. The ovary appeared healthy and gave no evidence of cystic degeneration. After the removal of the appendix the subsequent menstruation gave very little, if any, pain.

I may state that in these cases a rectal examination proved most helpful in differentiating a diseased appendix from a diseased ovary. The pain caused by the examining finger as it was swept into the region of the right iliac fossa was very severe, while the left iliac fossa gave no reaction whatsoever.

The operation demonstrated a diseased appendix, but gave no evidence why an attack should invariably be precipitated a few days before menstruation set in. All that could be surmissed was that the diseased appendix simply remained dormant till the monthly physiologic congestion of the pelvic viscera took place, but until Dr. Otto Schwarz gave his excellent paper to this Association last year, when he demonstrated by lantern slides the microscopic pictures of endometrial

tissue patches in the mucosa of the appendix, this endometrial tissue was, of course, aberrant and had no business in the appendix. The finding of this tissue made it at once clear how an appendix can evidence a true picture of appendicitis shortly before the menstrual period. The ablation of the appendix will cure the condition.

I invariably follow up the dictum of Morris, and frequently am satisfied in arriving at a diagnosis of chronic appendicitis. But if I still remain in doubt, I endeavor to make it more clear through a rectal examination. The result of this examination, together with other existing signs and symptoms will usually give me a satisfactory understanding of the case.

One of the Fellows spoke of his unsatisfactory results after the removal of the appendix. Sometimes these patients require from one to three years to again be able to enjoy reasonable good health. Their body defenses have been damaged, many tissue cells have suffered and have undergone changes, and the whole body organism has been struggling along with a greatly lowered resisting power. However, the cause has been removed, so that the constructive processes may again go on unhampered.

DR. H. PANTZER, INDIANAPOLIS, IND.—I wish to refer to a cause of barrel-shaped cecum and ascending colon, rarely, but distinctively, present in those cases where there is congenital or acquired constriction of the hepatic flexure of the colon. In these cases a tender area obtains at the site of the hepatic flexure: easily elicited by anterior and posterior palpation over the part.

An etiologic anatomic connection between the appendix and the ileocecum on the one side, and the genital organs on the other side, is manifest in those cases where the ileogenital band is very short. This band extending from the right ovary to the ileocecal junction, when unusually short, makes traction which entails dislocation and distortion of all the organs involved. This condition present in a given case will reveal tenderness in such a region, which, with light palpation, can be detected by very circumscribed muscular reaction just over the parts involved.

DR. W. S. BAINBRIDGE, NEW YORK CITY.—I too have found, in chronic appendicitis, the referred point across the right iliac region, within a short distance of the median line, to which Dr. Morris has called attention. I believe that there is no question but that some of the points emphasized as indicative of chronic appendicitis by Morris, will prove of aid to us in making future diagnosis of abdominal conditions.

There are one or two points I should like to bring out in connection with the paper and discussion. First, I wish to call attention to a paper presented before this Society by Otto H. Schwarz, at Philadelphia. In this paper, Schwarz ably describes what might well be called a fourth type of appendicitis in the female, a chronic appendicitis due apparently, to endometrial tissue in the appendix. More than 400 ovaries were examined by Schwarz and a number contained endometrial tissue. This condition has been described by other writers, including Sampson. Sampson reported finding 43 such lesions in 170 abdominal operations. Such an explanation of some of the mild attacks of appendicitis, so-called, at the menstrual period, should be given serious consideration.

I finally believe that many of the failures to secure satisfactory results, following the removal of the appendix, are due to omission to conserve the mechanics of the caput coli. When some surgeons take out the appendix, they do not fasten the longitudinal bands back in position so that they have a point of advantage from which to pull. Such is very necessary in order to allow Nature to secure the complete elimination of material in the cecum.

In fractures of the patella, we attempt to secure the closest union of the bone, so that, relatively, it may not be elongated from the point of insertion to the point of pull. To reverse the procedure in surgery of the appendix, reduces the number of our successful appendix operations, and gives the gastroenterologist his opportunity to enumerate the failures which, from time to time, follow the operation for appendicitis.

DR. ROBERT T. MORRIS (closing).—It was because of certain worthless appendix operations that I did, that I began to inquire rather closely into the reason, not only for the interest of the patients, but to satisfy my curiosity. I found that most of the worthless appendix operations occurred in young women who had so many other kinds of trouble that the appendix feature was only one. These patients who have fibroid degeneration of the appendix, lose simply that particular part of the disease which centers about the appendix. After they gain a few pounds in weight and get red cheeks and get a great deal better because of the psychology which is exerted at the time of the operation, they begin to fail again and develop other symptoms.

I think you will find most of the worthless appendix operations have occurred in patients who have a fibroid degeneration of the appendix, patients who usually have relaxed perineal supports, dropped colon, loose kidneys, and general disturbance of the endocrine functions.

The Doctor's point about pressure over the site of the appendix giving reflex pain to other sympathetic ganglia is quite correct. We do not have tenderness at the site of the chronically irritated appendix, but if we press upon the irritated appendix we will often have a response from sympathetic ganglia about the navel or at a distance.

Dr. Pantzer says in chronic appendicitis a gentle touch upon the abdomen will bring out momentary resistance. That is quite true, but it is not differentiation diagnosis. That belongs to a lot of other cases in which your iliohypogastric and other nerves in the abdominal wall, are sympathizing, or representing the peripheral area corresponding to some irritated internal organ.

DR. H. D. FURNISS, New York, presented a paper entitled **Suprapubic Sphincter Tightening.** (For original article, see page 503.)

DISCUSSION

DR. FURNISS.—This operation is done with the bladder empty because it gives considerably more room. I use twenty-day chromic catgut. A certain amount of scar tissue results which will give permanent puckering.

Stitches inside the bladder must be avoided, not because of stone formation, but you are apt to get an inflammation of the bladder, that may be very troublesome.

I do not want anyone to feel I am offering this as a substitute for the Kelly method, for I think the Kelly operation simpler, easier and the results probably better. My operation is for those difficult cases, where because of small vaginas and atrophied tissues the Kelley method is almost impossible to perform.

DR. LOUIS E. PHANEUF, Boston, Mass., presented a paper entitled **Prolapse of the Culdesac of Douglas or Posterior Vaginal Enterocele.** (For original article, see page 507.)

DISCUSSION

DR. PANTZER, INDIANAPOLIS, IND.—The subject is one of great interest, particularly because it is commonly not recognized, at least, not early. It is surprising

to what extent the early stages can be overcome by a proper abdominal support, exercises for the weakened abdominal musculature, the wearing of a not too wide pessary or frequent knee-chest position. Recently I had two cases where the entire rectum was prolapsed, lying in a tortuous mass low down against the perineum which required shortening of the peritoneal structures from above. The measures mentioned for the early stages should be invoked with persistence. It is surprising how many of these cases in the early stages, will make a good recovery by proper nonsurgical treatment.

DR. LOUIS E. PHANEUF, BOSTON, MASS.—Just one word about prophylaxis in the early stages. If these cases follow the methods described by Dr. Pantzer, they will never come to the extreme type of prolapse. The great difficulty is that the gynecologist seldom sees these cases early, at least, those who came to me came with fully developed vaginal enterocle.

OBSTETRICAL SOCIETY OF PHILADELPHIA

MEETING OF MAY 1, 1924

THE PRESIDENT, DR. EDMUND B. PIPER, IN THE CHAIR

DR. LEWIS C. SCHEFFEY read a paper on **Sarcoma of the Ovary in Children and Young Girls,** With the Report of a Case. (For original article, see page 490.)

DISCUSSION

DR. CHAS. C. NORRIS.—I have seen but one case of ovarian sarcoma in a child, five years of age. The diagnosis was not verified either by operation or autopsy; however, the clinical picture was well defined. The abdomen had been enlarging for three months, accompanied by considerable loss of weight and impairment of the general health. Colicky pain throughout the abdomen had been present for one month. At no time was there any bleeding.

The child was markedly emaciated and anemic. Occupying the lower and central abdomen was a soft, solid, spherical tumor the size of a large grapefruit.

Examination *per rectum* showed that this sprang from the pelvis by a pedicle of moderate length, which permitted a free range of movement. The uterus could be palpated as a separate body; the condition of the opposite ovary could not be determined, but no palpable enlargement was detected. The external genitalia were normal. Operation was out of the question on account of the advanced stage of the tumor, evident metastases and the general condition of the patient. Death resulted a few weeks later.

Ovarian tumors are infrequent among infants and young girls, the least rare being sarcomata and dermoids. Among young patients the proportion of malignancy is much higher than in adults. Ovarian sarcoma occurring in infants and young girls must be considered a rare tumor.

Among 1028 specimens of ovarian neoplasms in the Gynecological Laboratory at the University of Pennsylvania, all of which have been subjected to a rigid histologic examination, 137 or 13.33 per cent, have been found to be malignant; of these nine were sarcomata. All occurred in adults. In our series sarcomata constitutes 6.5 per cent of the malignant tumors and 0.87 per cent of all the ovarian neoplasms. Pfannenstiel found 5.38 per cent of sarcomata in a series of 400 ovarian tumors. Dr. Flatz has very kindly reviewed the records of the

Children's Hospital of Philadelphia since 1897 and has failed to find a single case of sarcoma of the ovary occurring in that institution.

Sarcoma of the ovary may occur at any age and Doran has observed a case of bilateral, rounded-cell sarcoma in a seven months' fetus. Among our nine cases three were between 31 and 40 years, two between 41 and 50 years, two between 51 and 60 years, one between 61 and 70 years and in one the age is unknown. Two of these cases were associated with sarcoma of the fundus. R. Frank and Pfannenstiel remark upon the frequency of the tumor in young women.

Four of our cases were of the spindle-celled type, three of the small round-cell, two of the mixed-cell variety.

Of our three year cases which we have been able to trace, all the spindle-celled types are alive, 50 per cent of the mixed-cell type survived and only 33.3 per cent of the small round-celled cases failed to suffer recurrence.

Only two of our nine cases were bilateral.

DR. GEORGE W. OUTERBRIDGE.—I was particularly interested in this case because at that time we happened to have sarcoma of the ovary in three young girls at the Methodist Hospital. One of them was operated on by Dr. Norris, a child, four or five years of age, with marked development of the mammary gland and distention of the veins of the abdominal wall. That case has been reported before this Society. The second case was one Dr. Nicholson operated, a young Italian girl about 11, who had a very massive sarcoma of one ovary, the other side entirely healthy. Dr. Nicholson did a panhysterectomy and since then the girl has been entirely well.

DR. JOHN O. BOWER and DR. J. H. CLARK presented a paper entitled **Myeloid Leucemia, Complicated by Pregnancy, Treated with Topical Applications of Radium.** Report of two cases (See page 207, February issue.)

DR. WILLIAM P. GRAVES of Boston, Mass., then read by invitation a paper entitled **Contraindications to the Use of Radium in Gynecology.** (For original article see page 445.)

DISCUSSION

DR. JOHN G. CLARK.—Dr. Graves has pointed out the salient contraindications to the employment of irradiation in the wrong class of cases. In all novel procedures there is a great tendency, and I believe this applies with particular force to our American colleagues, for the ill-advised use of all new therapeutic remedies. Pioneer workers may point out the dangers of a remedy which has been based upon carefully noted objections and yet all too often the novice who could so easily avoid these obstacles will steer head on into them, although these hazards have been charted accurately. As Dr. William Mayo has said, there are innumerable physicians and surgeons buying a nickel's worth of radium and doing a million dollars worth of harm with it. Possibly the lure of dividends from a new investment may at times becloud therapeutic judgment. Because I am so constantly being consulted by those who have been badly advised in the use of radium and are seeing the disasters of a good remedy injudiciously used, I particularly favor therefore all articles which point out the dangers of this remedy. Keene and I have dwelt at length upon these points on several occasions when this issue has been up for discussion. Given a radiologist who is not a surgeon, or a surgeon who is not a radiologist these patients will certainly not get a square deal with either, but I frankly believe that less harm will be done by such a surgeon than by the radiologist. As all of these tumors should primarily

be passed upon by the gynecologist likewise their treatment by irradiation should be controlled by him.

A history of present or past inflammatory involvement of the adnexae is a positive contraindication to irradiation, and if the question of childbearing is an issue, only under unusual precaution should this remedy be employed. In very young women who suffer with menorrhagia of ovarian origin, radium may be used with due care and the menses restored to normal without prejudice to the childbearing future, but in our experience this does not apply in cases of myoma in married women, which are causing menorrhagia. Here surgery has prior preference, first in the hope of performing a myomectomy, and second, of preserving the ovarian influence should a myomectomy not be feasible. Thus we find that age constitutes a zonal line; below forty, surgery is the elective means of treatment; above this, irradiation. In general, I am in full accord with Dr. Graves' limitations and strictures in the employment of radium. Dr. Graves has spoken of that unique and brilliant discovery of Sampson, the chocolate cysts of the ovaries. Sampson attributes their origin to the retrograde transportation of uterine mucosa from the uterine cavity out through the tubes to the ovaries and into Douglas' culdesac, where these transplants may develop perforating cysts of the ovary, and actually may find pathologic lodgment on other pelvic sites. He warns of the possible dangers in cancer of the fundus of stirring up and causing these transplants through curettage. We have had one case in a young woman only twenty-four years of age in whom a curettage was performed and a pathologic examination revealed a carcinoma of the fundus. Radium was applied at the same sitting. When the diagnosis had been fully corroborated by a second curettage six weeks later, a hysterectomy was performed. In addition to an early carcinoma of the fundus, a small mushroom-like excrescence was found on the ovary which proved also to be carcinoma. Was it a transplant from the uterus which had been loosened during the curettage? Such an incident appears plausible in the light of Sampson's warning.

I am especially interested in Dr. Graves' statement that through his employment of radium he has dropped his operative selection of carcinoma of the cervix from sixty to twenty per cent. In my discussion of the use of irradiation versus the radical operation, I have thus far maintained that in the hands of an expert I would not decry radical surgery, but since the experts are "few and far between," I really believe the greatest good for the greatest number of those victims will follow from carefully administered irradiation rather than from these very dangerous operations which carry besides a high mortality, a considerable morbidity percentage.

In my Clinic at the University Hospital we have practically reached the parting of the ways and now tread the radium path. The best five-year salvage we ever obtained from the radical operation was 33 per cent of five-year cures. With radium, we have a 27½ per cent salvage of operable cases and 7½ per cent salvage in borderline and inoperable cases. Thus our ratio of cases is almost equal with the preference slightly in favor of radium. The difference on the other hand in favor of a short detention in the hospital, an immediate return to preradiation efficiency, with practically no mortality, far outweighs the surgical side of this question. As will appear later in a carefully supervised study of this novel therapeutic remedy by Dr. Greenough, Chairman of the Cancer Committee of the American College of Surgeons, the radical operation alone and irradiation alone are about equal in ultimate results, whereas the preliminary use of some palliative operation, such as cauterization, amputation of the cervix plus irradiation, etc., supersedes them both in three-year curative possibilities.

DR. BROOKE M. ANSPACH.—Dr. Graves has pointed out, very properly, some of the dangers attending the use of radium. The indications for its use in gynecologic practice are today rather clear-cut and well-defined and in the overwhelming majority of instances, attended with no complications or unfortunate sequelae. Indeed, when properly applied, it has come to be regarded as a very efficient but withal a harmless remedy. Nevertheless, there are certain contra-indications to its use, or rather certain conditions in which radiation is not the best plan of treatment and may be dangerous. I wish to report several cases that occurred in my own practice in which it would have been better had radium not been used. In the first one, a myoma, the size of a billiard ball, which I thought was uncomplicated. The patient was very stout; the usual application of radium was made; fever and lower abdominal pain immediately followed; under the customary treatment for pelvic peritonitis, the symptoms increased and a pelvic tumor developed, rising above the pelvic brim. At operation I found a thin-walled cyst of the ovary, filled with chocolate colored fluid; evidently there had been a cyst of the ovary of small size which was not recognized even under anesthesia on account of the very fat abdomen. She certainly did not have a tumor of any size at the time of the application, but inside of three weeks she had an ovarian cyst as large as a good-sized grapefruit, with persistent elevation of temperature. In another case of myoma, in which old inflammatory lesions were not recognized, a pelvic abscess developed which required evacuation by a vaginal incision.

I also wish to report an instance of metastasis of a carcinoma following the use of radium which may or may not have been due to the radium, for I have never seen it after curettage alone. It was a suspected carcinomata of the endometrium; the curettings appeared carcinomatous, and I made application of 100 mg. of radium preliminary to operation if the pathologist confirmed the clinical diagnosis; he did so, and at the end of a week, I did a complete hysterectomy; the disease had gone almost through the uterus at one point near the fundus. After an uneventful convalescence and about the time for discharge, the patient complained of a pain in the leg, and then developed a metastatic carcinoma of the tibia. She died a very miserable death. Whether that had any relation to the application of radium at the time of curettage I do not know, but it is at least worthy of note. I have seen recently at the Jefferson Hospital, a case in which, after an application of radium to the cervix, done elsewhere, the patient developed a carcinoma of the right broad ligament which blocked the ureter; there was no evidence whatever of the disease at the original site.

Dr. Graves' paper reminds us that radium is a wonderful help—a marvelous remedy and safe in properly selected cases, and when correctly used, but we must not forget that it is not universally applicable and that it may cause much mischief when badly used.

DR. FLOYD E. KEENE.—I wish to emphasize the warning Dr. Graves has sounded regarding the dangers which follow upon the indiscriminate use of radium. I feel very strongly that the advent of radium marks a distinct advance in gynecologic therapeutics. On the other hand, I am equally confident that if this therapeutic agent is placed in the hands of men unskilled in its use or unappreciative of its dangers, very grave results will follow. There are three requisites which are essential to successful irradiation. First, a skilled diagnostician, one who is not only skilled along the lines of diagnosis, but also is in a position to appreciate the relative merits of operation or irradiation in the treatment of a given condition. Secondly, a competent gynecologic pathologist and third, a consulting radiologist who fully appreciates the limitations of x-ray or radium treatment.

Unfortunately the day is past when radium is available only in the larger institutions where these requisites can be met and because of this many cases will be treated unwisely and not only will radium therapy be discredited thereby, but what is more important, actual harm will be done to many patients. Since we began to use radium in Dr. Clark's Clinic in 1912, our cases have been followed very carefully from year to year and from this experience we have formulated very definite conclusions as to the indications and contraindications to radium therapy. In addition to the contraindications which Dr. Graves has mentioned, namely, the large tumor, the pedunculated, hard, subperitoneal tumor, the necrotic tumor, or tumors in young women, in all of which we agree, it seems to me, there are a few others which might be mentioned which are equally important. We look upon pain in association with myoma as one of the chief contraindications to irradiation. Speaking generally, pain means one of three conditions, namely, an associated adnexal inflammatory disease, degeneration of the tumor, or adenomyoma. Dr. Graves has enlarged on the ill results following upon irradiation in the presence of infection. It is self-evident that a necrotic tumor or a tumor presenting extensive degeneration should never be irradiated. We are still in doubt as to the effect of irradiation upon adenomyomata but our belief thus far is that the results are usually unsatisfactory. Therefore, it can be said that any tumor associated with pain is better treated by operation than irradiation. We believe that radium should not be used in the presence of pressure symptoms irrespective of the size of the tumor. While it is undoubtedly true that tumors are reduced in size following upon irradiation, this reduction requires a matter of months and operative removal is better than trusting to this long delay. Again, a rapidly growing tumor contraindicates radium, suggesting sarcoma or some type of rapidly forming benign degenerative process. Lastly, I would emphasize the inadvisability of using radium in treating women of highly nervous temperament. The severity of menopausal symptoms can never be prophesied even in the normal woman; in the highly nervous individual, these symptoms are often very marked. Our experience has taught us that the symptoms of a premature menopause brought about in highly nervous women are often extremely severe and for this reason, we feel that operation is preferable to irradiation.

In closing, I would say a word as to the use of radium in the treatment of carcinoma of the cervix. It is undoubtedly true that when intelligently applied, radium offers more in the way of relief to inoperable cases than any other means at our disposal, bringing about, as it does, a cessation of the bleeding and foul discharge and often relieving pain at least temporarily. While formerly every case of advanced malignancy that presented itself to our clinic was treated, we now feel that such a course is a mistake, so that we no longer apply radium to those cases in which there is wide extension to the bladder or rectum because the effects of radium can very readily bring about a condition which makes the patient's suffering even more deplorable than before the radium was applied.

DR. GRAVES, (closing).—Our experience in using radium for cancer corresponds very closely to the conclusions Dr. Clark spoke of, as being found by Dr. Greenough, who is getting up statistics for The American College of Surgeons. For example, we find postoperative use of radium in cases where we had done perfectly satisfactory operation did not seem to do much good. There was more danger of fistula and we gave that up entirely in cases we felt satisfactorily operated upon. We have long ago given up preoperative use of radium. I can't see the slightest sense in it or imagine why it is done. We also discovered surprisingly good results in partial operations, and I would ask Dr. Clark if this has been his experience.

DR. JOHN G. CLARK.—Occasionally, not many.

DR. GRAVES.—In what seemed partial operations where we felt pretty sure we had left in some cancer in the cervix. In several cases where we had packed out in hysterectomy and left cancer there and then gave radium, we obtained surprisingly good results. Recently I have had no cases where I have deliberately done supravaginal hysterectomy. In some cases after taking out glands the patient has been cured and then given radium later.

NEW ORLEANS GYNECOLOGICAL AND OBSTETRICAL SOCIETY

MEETING OF JANUARY 8, 1925

DR. JOHN F. DICKS reported a case of **Severe Vaginal Postoperative Bleeding.**

A white woman, aged twenty, had a vulvovaginal gland on the right side and a fistulous tract leading from it, for which operation was done with an uneventful recovery. She was about to be discharged when pain developed on the other side and examination showed a similar glandular involvement, for which a second operation was done under local anesthesia. At neither operation was there excess bleeding nor was trouble of any sort anticipated. After a second uneventful recovery she went home and ten days later, when she was up and moving about, she had a rather profuse hemorrhage from the site of the left vulvovaginal gland. Packing was attempted at home, but as the hemorrhage could not be checked she was rushed to the hospital, where further packing was done and tannic and gallic acids applied. When these measures failed to check the bleeding the bed of the gland was finally sutured. The hemorrhage was checked for forty-eight hours, then recurred very profusely. By that time the loss of blood had become very serious. When the coagulation time was found to be six minutes she was given 20 c.c. of horse serum, and then taken back to the operating room. The only way the hemorrhage could be checked was by deep retention sutures from the outside into the bed of the gland fastened over an iodoform pack. She remained in bed a week without trouble of any sort, and has been perfectly well since.

I have reported the case with the idea of arousing some discussion as to the best methods of controlling hemorrhage from the cervix and vagina. I remember one case of postoperative hemorrhage after an amputation of the cervix, in which I used catgut sutures; the woman bled to death on the table. I felt then that sutures were wrong and ever since have used packs with very much better results. In the case I have reported, however, packs were useless and only very deep sutures controlled the hemorrhage. The most interesting part of the case, to me, was the way the bed of the gland gave way entirely after the first suturing, and how the coagulation time of six minutes gave no trouble at first. What controlled the hemorrhage eventually I do not know, but I am inclined to think that the horse serum and the immediate reduction of the coagulation time to three and one-half minutes had something to do with it. The abscess was not of specific but of colonic origin and had evidently originated in the fistulous tract.

DISCUSSION

DR. P. GRAFFAGNINO.—Operations near the vulva may lead to alarming hemorrhage and even threaten life. As to methods of controlling the bleeding,

I have found that lowering the coagulation time plus a pack usually gives good results.

DR. E. L. KING.—At the Presbyterian Hospital ten or twelve years ago we had several cases of hemorrhage following amputation of the cervix; in fact, this was one of our most frequent postoperative troubles. We had a regular system of packing with compound alum powder. It was tied up in little bags about as big as the end of the thumb and half a dozen of the bags were pushed up against the cervix with a plain gauze pack behind them. We never used sutures. These packs remained in place from twenty-four to forty-eight hours and we had better results than when we were accustomed to suture all such cases of hemorrhage.

DR. HENRY MACHECA.—I recently did a Sturmdorff operation at Charity and the patient began to bleed on the eighth day. I packed her firmly and checked the bleeding, but when the pack was removed at the end of forty-eight hours the hemorrhage recurred. I repeated the procedure, and two days later she expelled the pack and had another profuse hemorrhage. She was taken immediately to the operating room and examined under anesthesia. The cervix showed no evidence of any sutures at all; the mucous membrane had slipped back as a cuff, showing the operation was faulty to begin with, and the bleeding point was located on the posterior wall. The control of the hemorrhage was then a simple matter. The point I would make is that if you would examine these patients under an anesthetic as soon as they begin to bleed and not wait until they are exsanguinated, you would see exactly where the hemorrhage is originating and the control of it would be a much simpler matter.

DR. DICKS (closing).—I want to make it clear that the coagulation time after the hemorrhage was six minutes and after the administration of the horse serum three and one-half minutes. I agree with Dr. King that suturing the cervix in postoperative hemorrhage usually gives poor results. Heretofore packs and tannic and gallic acid have usually been successful in my hands.

DR. P. GRAFFAGNINO gave an informal talk on **Spinal Anesthesia.**

He outlined the history of its development, discussed its physiologic effects, its advantages and disadvantages, and the indications for its use, and closed with a report of recent cases in which he had used this method. Case 1 was a large fibroid complicated by tubal disease, general anesthesia being contraindicated by the patient's very poor general condition and unquestionable pulmonary tuberculosis. Case 2 had multiple fibroids, and general anesthesia was contraindicated by a cardiac condition, obesity and high blood pressure. Case 3 had an extensive anterior and posterior colporrhaphy and a hemorrhoidectomy, general anesthesia being contraindicated by chronic kidney disease, high blood pressure and three recent general anesthetics. Case 4 was tentatively diagnosed as an ectopic but proved to be a very large tuboovarian abscess with appendiceal involvement. General anesthesia was contraindicated by her poor general condition. In all of these instances the operation was performed with ease and with perfect relaxation, and the patients made rapid and uncomplicated recoveries. Dr. Graffagnino stressed the point that he was not advocating the promiscuous use of spinal anesthesia but only its use in carefully selected, occasional cases, and that he was bringing the subject before the society because of the fact that few of the local surgeons were using this valuable anesthetic aid.

DISCUSSION

DR. E. L. KING.—When I was an interne at Charity Hospital, Joseph Danna did a bilateral renal decapsulation on a man of fifty who had had complete suppression of urine for a nearly a week. The operation was done under spinal anesthesia, and the patient's kidney function returned within the first twenty-four hours, when he passed about 100 oz. of urine. He died finally from other complications, but the decapsulation under spinal anesthesia was a complete success. During the war I was on duty at Fort McPherson, Georgia, under Colonel Babcock of Philadelphia, who does everything under spinal, so we used it extensively at the hospital. He did practically everything from the diaphragm down under stovaine, and even tried a thoracotomy once or twice, but in this he was not successful. In hemorrhoids, varicoceles, hernias, etc., the results were excellent, but in other abdominal work we frequently had trouble. Gastroenterostomies, the removal of an acute suppurating appendix or a bad gall bladder, and similar operations are not always satisfactory. We had considerable difficulty with retching and vomiting which, as usual, always occurred at the most unfavorable time possible. We did not use oxygen inhalations, as Graffagnino has suggested, and they might have overcome this difficulty. I noticed in a recent journal that some one is advocating a sort of psychoanesthesia. The idea is that in any sort of operation when the patient is awake, whether the anesthesia is local, spinal or splanchnic, particularly if it is prolonged for an hour or more, some moral support is needed; therefore the function of one of the operating room nurses is to encourage the patient. I believe, as Graffagnino brought out, the method is rather more adapted to the occasional case where the usual methods are contraindicated than to general use. One great disadvantage in the army hospital was the intense headache which the patients often complained of for days afterwards, and at Charity, during my interne days, I remember that retention of urine was a frequent complication with this type of anesthetic.

DR. JOHN F. DICKS.—For the past year I have been interested in the use of local anesthesia in gynecologic work, preliminary scopolamine and morphine, and the infiltration of the parts with novocaine. I have had excellent results and I think the method deserves wider use.

DR. C. JEFF MILLER.—Great interest was manifested in spinal anesthesia some years ago, when many believed it would supplant general anesthesia in pelvic work, but it was not long before its limitations were defined and its disadvantages discovered. The objections are well known but I may say that I have seen headaches following its use last from two to three weeks. Within recent years sacral anesthesia has largely supplanted spinal. It is technically more difficult but the results are better and there are fewer bad after-effects. Spinal anesthesia was once strongly advocated for obstetric work but the objections are so obvious that it is rarely used now. Obstetric cases requiring such pronounced anesthesia would be more properly dealt with by sacral anesthesia, and certainly with less risk.

DR. P. GRAFFAGNINO (closing).—In answer to Dr. Gladden's question about vaginal removal, we had considered this, but the size threatened to make the procedure a very trying one. My reason for bringing this procedure before you was to advocate its use under special conditions. Sometimes a situation confronts us, as in the first case I reported, in which the x-ray showed apparently active tuberculosis, the patient had had fever for weeks, and general anesthesia was contraindicated. Moreover, she was greatly emaciated and we felt that any anesthesia other than local would not only involve a risk but would probably terminate fatally. But because of the size of the mass and the acute inflammation we did not feel that

local would be successful. After the patient was put in the Trendelenburg position we had no more difficulty than if she had been under a general anesthetic. Multiple adhesions were readily released and although the operation lasted an hour the patient showed not the slightest sign of shock or collapse. In Case 4, which we had diagnosed as an ectopic but which proved to be a tuboovarian abscess, the results were equally striking.

DR. C. JEFF MILLER read a paper entitled **Some Phases of Dysmenorrhea.** (For original article see page 524.)

DISCUSSION

DR. E. L. KING.—The value of exercise and general hygiene in these cases was recently impressed upon me very forcibly. A young woman had had several curettages, one of which I did, with practically no relief. I also put in a stem which she wore for two months, but after some six or eight months the improvement wore off and her condition was as bad as it was originally. She is a teacher and has never taken much exercise. She came to see me early last summer, willing to have a laparotomy or to do anything else I could suggest that offered a prospect of relief. Her appendix had been removed and she might have had some adhesions, but vaginal examination showed no pathology in her pelvis and I did not consider that I had sufficient justification for opening her abdomen. She disappeared, but about a month ago she came back to see me, to tell me that she was better than she had been in years since she had learned to swim and to drive a car. This case made me realize very forcibly the value of regular exercise in the treatment of obstinate dysmenorrhea. I have had no results from glandular therapy in dysmenorrhea or in anything else, but I have had very good results from benzyl benzoate. The forewoman at one local factory keeps a supply on hand and serves it out when necessary, and she tells me she has had better results from it than from viburnum, which was her previous stand-by. She does not cure the girls, of course, but she enables most of them to stay at work.

DR. J. S. HEBERT.—I was particularly interested in the figures Dr. Miller quoted on the use of the stem pessary. I was under the impression that this is a rather dangerous procedure because of the chances of an infection and I should like to hear from him whether this occurred in any of his cases.

DR. JOHN F. DICKS.—I agree with Dr. Miller about glandular therapy. My results have been uniformly poor. I have had good results from the use of the stem in selected cases but as a usual thing I find that proper hygiene plus regular exercise accomplish just as much as other more radical measures.

DR. MILLER (closing).—In cases of essential dysmenorrhea not benefited by dilatation or dilatation with the stem I frequently find that my original diagnosis has been wrong. The average case is promptly relieved. In some instances later I found small fibroids developing or possibly mild adnexal disease. In reply to Dr. Hebert's question as to possible infections following the use of the stem, in three early cases, not included in this series, mild infections did develop, but fortunately there were no lasting results. Patients wearing a stem should be cautioned to keep quiet if they are conscious of pain, and if there is the slightest rise of temperature the stem should be removed at once. A careful selection of cases, however, will obviate these mischances. This procedure is not adapted to women who have borne children; there are usually other causes for their discomfort. In the cases in this series reported as failures there were marked types of underdevelop-

ment, and the nearer they approached the infantile type, the fewer were relieved. I think we are too prone to advise rest in bed during painful menstruation in young girls. If pathologic conditions can be eliminated it is probably wiser to insist upon their continuing their routine life. Gymnastic work is especially beneficial, and I habitually refuse to sign certificates excusing young girls from such exercises in school. Before leaving the subject of the stem, I should like to report one case, at present in the hospital, on whom I used the stem three times for dysmenorrhea and sterility. When I opened her abdomen during an attack of appendicitis I found both the uterus and the ovaries so small that it seemed impossible that she could ever bear children. She refused to accept my verdict and continued to haunt the office, and I continued to hope that eventually by natural rotation she would give me up and go to somebody else. Last fall she appeared again, three months' pregnant, and a few days ago I delivered her of a child that was alive and healthy though somewhat premature. I had worked on her for eleven years before this happened, and the outcome of such an obstinate case is not always a happy one. As to benzyl benzoate, I gave it a generous trial just after it was advocated by Litzenberg. I prescribe 20 to 25 minims every two to three hours until relief is obtained, and I have occasionally prescribed it a day or two in advance of the flow. It has some virtues but the results are not uniformly satisfactory. As I have already said, I do not believe we use atropine enough, especially in fat, plethoric women. The woman over thirty, whose dysmenorrhea is increasing and who is without prospects of childbearing, furnishes a problem which must be faced. I believe that such cases are eventually more comfortable after hysterectomy if the tubes and ovaries are healthy and can be left undisturbed. Such patients are comfortable for a period of years and will show the symptoms of the menopause only when they reach the climacteric age, furnishing beautiful illustrations of the continued function of the ovary after the uterus is removed.

DR. J. W. NEWMAN.—What are the objections to performing the Stratzman or some other cutting operation on the cervix?

DR. MILLER.—Very few of them are of real benefit, and many of them leave the patients in worse condition than they were before operation. Indeed I have occasionally operated to correct conditions arising after these operations were done. Dudley's operation was devised for a particular type of case and no doubt it has been unsuccessful in many instances because the cases were badly selected. Blair-Bell's hysterotomy is indicated in some of the very severe types but it is a tedious and difficult operation and may be followed by considerable scar tissue. It has certainly a very limited scope.

DR. C. A. WALLBILLICH.—I have always been interested in Norris' theory that the ovaries will not function after the endometrium of the body of the uterus is removed. I judge that you do not agree with him.

DR. C. JEFF MILLER.—Norris gave no definite proof of this theory but discussed it from a physiologic standpoint, and I do not believe we can yet accept his statements as final. I have done a large number of hysterectomies both with and without oophorectomy, and I have no hesitancy in saying that when healthy ovaries are left *in situ* the postoperative history is smoother than when they are removed. Of course due care must be exercised to leave the ovarian vessels intact or cystic changes will invariably follow and oophorectomy will finally have to be done.

Department of Maternal Welfare

THE JOINT COMMITTEE ON MATERNAL WELFARE, ITS ORGANIZATION AND PURPOSES

By Fred L. Adair, M.D., Chairman

To those who are unfamiliar with the development of the Joint Committee on Maternal Welfare a few words in explanation of its origin may be timely. The joint committee developed out of a resolution which was adopted at the tenth annual meeting of the American Child Health Association. This resolution was to the effect that the American Child Health Association ask the American Gynecological Society to appoint a committee to confer with it regarding the elaboration and development of a maternal and child welfare program in the United States. This meeting was held in November, 1919.

The following year the American Gynecological Society authorized the appointment of the committee in accordance with this resolution. A collaborative committee was also appointed from the American Pediatric Society. The original committee consisted of Dr. J. Whitridge Williams, Dr. Anna E. Rude, and Dr. Merrill E. Champion, representing the American Child Health Association, and Dr. George W. Kosmak, Dr. Fred J. Taussig, and Dr. Fred L. Adair, representing the American Gynecological Society. Later, three members were added to this committee, Dr. Henry L. K. Shaw, Dr. Fritz Talbot, and Dr. Walter Ramsey, representing the American Pediatric Society.

In 1921 there was added to this committee a similar one from the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons. The personnel of this committee was Dr. George Clark Mosher, Dr. Henry Schwarz, and Dr. George W. Kosmak. The joint committee worked out a tentative program of maternal welfare, which has been approved by the component societies.

The committee considered its functions to be an elaboration of a complete scheme of maternal welfare as ideally developed, and the indication of the relationship of maternal welfare to other health and welfare activities, especially infant and child welfare. It was considered advisable to have some responsible representative of well-qualified men to advise with governmental and state agencies on the

problem of maternal welfare. Lastly, the committee recognized the importance and necessity of working out problems of maternal welfare in conjunction with those of infant and child welfare by close cooperation with the pediatricians.

In a skeleton plan for "Maternal Welfare"* the committee recognized: First, the importance of the preservation of the life and health of the mother, especially by decreasing the number of infections following abortion and childbirth, and by control of the toxemias; second, the desirability of an increase in the number of fruitful pregnancies by a decrease in the amount of sterility, by a reduction of the number of abortions and the number of premature births, and by attempts at prevention of stillbirths. The committee recognized the urgency of more and better care of prospective mothers during the prenatal, natal, and postnatal periods.

If any concrete results are to be obtained in the improvement of conditions surrounding maternity and early infancy, the necessity of further investigation of the many problems which contribute to morbidity and mortality of both mothers and infants must also be recognized. A report of the committee embodying these ideas was given considerable publicity in *Mother and Child* of the American Child Health Association, January, 1922, iii, No. 1, and also in the AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY, 1923, v, 664.

The present committee consists of Dr. Robert L. DeNormandie, Dr. Ralph W. Lobenstine, Dr. F. L. Adair, Dr. W. C. Danforth, Dr. Frank W. Lynch, Dr. George Clark Mosher, Dr. Henry Schwarz, and Dr. George W. Kosmak, representing the American Child Health Association, the American Gynecological Society, and the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons. This committee has had very little financial support other than that contributed by the individual members who have carried on the work, and small contributions from the above mentioned societies. The main expenditures have been for clerical help, stationery, and postage.

During the past year the committee has endeavored to come into contact with all medical societies in the United States, through their secretaries. This was done through a circular letter, worded as follows, which was sent out some time ago:

"We are communicating with you as the Secretary of your Medical Society because we feel that the conditions surrounding maternity and early infancy are not as good as they might be.

"We feel that these conditions can be definitely improved, with a lessening of the mortality and morbidity of mothers and infants. We are certain that medical men and organizations can do a great deal to accomplish this saving of life and preserving of health among the mothers and infants of this country.

*See Transactions American Gynecological Society, 1920, 46, xl.

"It is our belief that the members of the medical societies should have their attention called to these conditions and that the programs of the meetings should include more papers and clinics on one of the fundamental but rather neglected branches of medical and surgical practice. It is hoped that in this manner the practice of medicine and surgery as it affects mothers and infants can be definitely improved.

"We are willing to help you and others to carry out such a program, and ask the earnest consideration of these points by your organization. We are willing and glad to assist in carrying out a program which is calculated to increase obstetric knowledge and improve the practice among the medical profession.

"If we can assist in securing speakers for your society or help in any other way, kindly notify one of the members of this committee who will be glad to be of assistance."

The various states have been assigned to the different members of the committee and each member is endeavoring to secure leaders for each one of the states assigned to him. The idea of having a state leader is to secure, if possible, some one individual in the state who will give his attention and make it his business to develop interest among medical men in the state, through their societies, in the practice of better obstetrics. The assignments of the states are as follows: Dr. DeNormandie, Maine, Rhode Island, Massachusetts, New Hampshire, and Vermont; Dr. Danforth, Illinois, Indiana, Iowa, Michigan, Nebraska, and Wisconsin; Dr. Kosmak, Pennsylvania, Virginia, West Virginia, South Carolina, Mississippi, and Connecticut; Dr. Lynch, California, Arizona, Nevada, Oregon, Idaho, and New Mexico; Dr. Lobenstine, Delaware, North Carolina, New Jersey, Florida, New York, and Maryland; Dr. Mosher, Ohio, Arkansas, Missouri, Kansas, Oklahoma, and Texas; Dr. Schwarz, Alabama, Colorado, Georgia, Kentucky, Louisiana, and Tennessee; and Dr. Adair, Minnesota, Montana, North Dakota, South Dakota, Utah, Washington, Wyoming, and the District of Columbia.

The committee is interested in furthering the practice of safe and sane obstetrics, stressing the importance of improved antenatal, intranatal, and postnatal care in the interest of both mother and offspring, and also for the benefit of the community. The committee feels that the only way in which permanent results can be obtained in securing better results for mothers and infants is by having the cooperation and interest of medical men in better obstetric and pediatric practice. We have made no attempt to reach lay people or lay organizations, but have tried simply to secure interest and cooperation of medical men who are practicing obstetrics and pediatrics.

In so far as the mother is concerned, we are primarily interested in the prevention of those conditions which contribute to loss of life and health in the mother, and especially in the elimination of those factors which are preventable. In so far as the fetus is concerned,

we are interested in the prevention of early fetal deaths as well as those deaths which occur later, either *in utero* or subsequent to birth, due to conditions which arise during gestation or parturition, and which may result in the early puerperium from infections or other preventable conditions.

In the May and subsequent issues the following articles are listed for publication in this Department. They constitute a symposium entitled, "Causes of our High Maternal Mortality," held at the New York Academy of Medicine, January 27, 1925.

1. Provision for Maternity Care in the United States.
   By Carolyn C. Van Blarcom.
2. What New York State is doing to reduce Maternal Mortality.
   By Florence McKay, M.D., director of division of maternity, infancy and child welfare, N. Y. State Dept. Health.
3. Responsibility of the medical profession in further reducing maternal mortality.
   By Austin Flint, M.D.

Department of Reviews and Abstracts

CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

Collective Review

THE OBSTETRICAL LITERATURE OF 1924

BY J. P. GREENHILL, B.S., M.D., CHICAGO, ILL.

(Continued from March)

PUERPERIUM

It was found by Emge[130] that cervical lacerations were present in 80 per cent of all women who had borne children and that surroundings and the best of obstetric skill did not prevent cervical trauma. The aim should be to promote primary union of the torn surfaces by some method of repair and this is probably necessary in 40 per cent of women. Fischmann[131] informs us that fibromyomata may cause the following complications during the puerperium: hemorrhage, febrile course, subinvolution, peritonitis, septicemia and pyemia, inversion of the uterus, torsion of the uterus and embolism. If a woman is allowed to go to term and a fibroid is present, cesarean section with immediate myomectomy or hysteromyomectomy is the safest procedure (Kosmak).

Rudolphson[132] recommends secondary repair after unsuccessful primary suture of a perineal laceration because it is nearly always successful. The result is the same whether or not the granulations are removed before suturing the surfaces of the wound.

Kanter and Pilot[133] found that the normal vagina rarely contains virulent hemolytic streptococci and there is no evidence that the presence of such streptococci plays any part in the production of puerperal sepsis. Any manipulation of the vagina increases the possibility of puerperal sepsis.

Heusler-Edenhuezen[134] mentions coitus during the last few days of pregnancy as the cause of puerperal sepsis and claims there is no mention of this association in the literature. However, a few months before this paper appeared, v. Büben[135] pointed out that sexual intercourse shortly before labor began, caused premature rupture of the membranes and puerperal sepsis. Even before this, Vignes[136] in 1923 mentioned the association and Ruge [137] in 1921 reported that of 82 women who had intercourse during the last three days before delivery, 17 per cent had high temperature during the puerperium. Also, in the Year Book of Obstetrics for 1922 there is mention of two deaths at the Chicago Lying-In Hospital directly traceable to intercourse during labor.

Heidler[138] reports an interesting case of a patient who had a cervical polyp removed six weeks before term because of bleeding. After the

child was born, a hysterectomy was performed because of uncontrollable hemorrhage. The patient died of puerperal sepsis 62½ hours after delivery and autopsy showed the source of infection to be the site of the polyp which was removed six weeks before delivery.

One of the most interesting contributions for the treatment of peritonitis, is Costain's operation of lymphaticostomy reported in *Surgery, Gynecology and Obstetrics*, March, 1923. This operation consists of ligating and opening the thoracic duct and is based on the findings that septic absorption in peritonitis occurs to a lethal degree through the lymphatics of the thoracic duct. Since Costain's original report there have been six additional cases[139] and of the total of seven cases there was one unsuccessful operation (Mitchell[140]). Edwards[141] reports a case of puerperal sepsis and general peritonitis treated by drainage of the thoracic duct. Local anesthesia was used and the patient recovered. Newman[142] produced fatal peritonitis in dogs by ligating the appendix and mesoappendix. In a second series, peritonitis was produced in the same way but in addition a lymphaticostomy was done and five out of seven dogs recovered.

In a series of 301 patients delivered spontaneously without any laceration, 10 per cent had fever and 0.6 per cent died, whereas of 113 women who had suffered lacerations, 35 per cent developed fever and 3.5 per cent died. Hence, Mansfeld[143] argues that when a patient has fever intrapartum it is essential to avoid laceration of the soft parts and one should not resort to operative procedures.

According to Canney[144] when fever appears in the puerperium, having excluded maladies outside the pelvis, it is far safer to give an anesthetic and carefully examine the patient's pelvis than "to wait and see." Because the septic uterus will not involute, Canney recommends the use of the Carrel-Dakin treatment assisted by drugs. It is the opinion of Cordy[145] that prolonged rest in the horizontal position is a fertile cause of puerperal sepsis and he therefore instructs his patients to sit up in bed at stated intervals.

In a maternity hospital where a number of patients exhibited high temperatures without any obvious cause, the source of the epidemic was traced by Ford[146] to a pupil nurse who had atrophic rhinitis. When the nurse was sent home the epidemic subsided but when the nurse returned another epidemic broke out. Mayer[147] points out that while the vast majority of puerperal infections come from without, there are cases which are endogenous and arise as metastases from a primary extragenital infection. This is especially true when tonsillitis or the grippe is present.

In a discussion of the serum treatment of puerperal sepsis which is advocated by Bailey,[148] it is emphasized that the preparation of the serum must be efficient from a serologic standpoint and that desensitization must be carried out if there is the slightest doubt that the result of the dermal test is negative. In a series of 13 cases the mortality was 15.3 per cent. Boek[149] treated 10 cases of puerperal sepsis with rivanol and all recovered.

It is definitely established that many infectious diseases can be cured by the introduction into the body of nonspecific substances which in themselves have no relation whatever to the infection. Milk is probably the substance most extensively used and Gellhorn[150] advocates the use of whole milk given intramuscularly for gynecologic and obstetric infections. Among 10 patients with frank gonorrhea six

were cured. Good results were likewise obtained in cases of puerperal infection and pyelitis during the puerperium. Cardiac decompensation, diabetes and alcoholism are absolute contraindications to the use of milk injections.

For some years there has obtained in New York State a high death rate from causes connected with childbirth. Eichel[151] absolves the midwives from the blame which many physicians would lay upon them. Since one-half the infections followed abortion or miscarriage, reduction of this mortality lies in the education of the public to the grave dangers of abortion, suppression of the criminal abortionist and competent care for the patients suffering from spontaneous abortion. Since one-third of the deaths were due to neglect, the public must be made to realize the hazards of abnormal conditions connected with pregnancy and there should be adequate hospital facilities for the poor. One-fourth of the deaths followed obstetric operations, hence extreme aseptic precautions are essential if an operation is necessary.

Four cases of hemiplegia which occurred during the puerperium are reported by Fruhinsholz and Francais[152] who show that their cases, like most of the reported cases, presented abnormalities such as long hard labor, delivery without an attendant, artificial delivery, other operative intervention such as manual removal of the placenta and fever before the onset of hemiplegia. The clinical symptoms suggest an arterial embolus in some cases and a venous thrombosis in others. Recovery is the rule.

NEWBORN

It was found by Keene and Hewer[153] that the fetal kidney begins to function at about the eleventh week of development and the liver at twelve weeks. The fetal gastric mucosa contains pepsin at sixteen weeks but no hydrochloric acid even at fullterm. The pituitary contains an active principle at eight weeks and the thyroid is producing colloid-like secretion at eleven weeks.

From an elaborate study on the question of natural immunity of the newborn, Musselman[154] concludes that the bactericidal action of human maternal serum and the content of complement are always greater than that of the newborn. Human colostrum and milk have very little if any bactericidal action. The author's studies indicate that the infant is only partially, if at all, dependent upon its mother for the development of normal antibodies or of natural immunity.

Müller[155] is of the opinion that maternal diseases of the thyroid gland as well as nephritis are very often detrimental to the development of the fetus. Acute infections like pneumonia in the mother, are most dangerous to the fetus. Tuberculosis is not hereditary but is acquired in early life. In syphilis we must differentiate the weakened, injured parental germ cells from the infected fetus. Fournier, Kraepelin and Hutchinson have shown that severe psychodegenerative symptoms frequently appear among offspring of syphilitic persons at an early age without any evidence of transmission of the disease.

The obstetric axiom that the umbilical cord must not be clamped or ligated until pulsation has ceased was experimentally tested by Williamson and Taylor [156] and they found that the statement of a certain gain in weight by waiting for cessation of pulsation is not true.

The attention of LaVake[157] was attracted by the fact that large placentas were found with large babies and small placentas with small

babies. This fact adds evidence in corroboration of the experimental and clinical futility of the attempt to produce subnormal birthweight by a dietary regime. Szenes and Mondré[158] maintain that women who menstruate for many days have longer and heavier babies than those women who menstruate only a short time.

In the experience of Driessen,[159] research has demonstrated that the development of the embryo in gravid rabbits that had been exposed in youth to the roentgen rays, was likely to be abnormal. Hertwig's experiments have confirmed the same for radium. The embryos are retarded in their development or are malformed. Driessen's recent research has shown that with exposure of one-half of the uterus, the pregnancy on that side is terminated, while the ovum on the other side continues its development unmolested. This proves that the effect of the exposure is a direct action on the ovum and cannot be ascribed to injury of the ovaries. Of the 18 known cases of childbirth after irradiation during pregnancy, only 50 per cent of the infants were apparently normal at birth. Archangelsky arrested the pregnancy in seven of ten tuberculous women irradiated to induce abortion before the seventh week and the dead embryos in every instance exhibited the same signs of direct injury to the cells as in the animal experiments. Pemberton,[160] however, believes that while radium placed inside the uterus has a local effect on the endometrium, it undoubtedly also affects the ovaries. He believes that although theoretically irradiation might result in a deformed or poorly developed child, it is certain that a patient can be treated with radium or x-ray and bear normal children subsequently. Care should be taken not to treat women during pregnancy because a poorly developed or deformed child may result. Spillman[161] also points out the dangers of x-ray in obstetrics and gynecology but Matthews[162] claims that after the usual dose of radium, pregnancy may occur and delivery be accomplished in a normal manner. The tendency to abortion is slightly more common following the use of radium. The offspring of previously radiated human subjects show no untoward effects and usually develop in a normal manner.

The most common symptoms of congenital goiter, other than the apparent size of the gland, are according to Skinner[163] those that result from compression of the trachea, such as dyspneic, long-drawn out inspiration and expiration associated with a hissing sound. If the infant does not die within the first 24 or 36 hours, the tendency is for the enlargement to diminish with rapidity even without treatment. Peterson and Miller[164] studied 120 infants for thymic hyperplasia and found abnormal enlargement of this gland in 43.3 per cent. All the infants with thymic hyperplasia were immediately treated with the roentgen ray and in none of the 120 cases were any symptoms attributable to the thymus noted after the second day of life. The mortality rate in this series was 4.1 per cent as compared with 5.8 per cent in a similar but untreated, consecutive group of infants. Evans[165] feels that in newborn infants who develop cyanosis, whether constant or intermittent, in the absence of other definite causes, persistent large thymus should always be suspected. Such infants, even in extremis, should be given the benefit of x-ray or radium therapy. Negative x-ray pictures do not mean absence of thymus pressure, since it is the weight and anteroposterior thickness of the thymus and not the width which causes pressure, unless the symptoms are due to an endocrine disturbance.

Wasson[166] took roentgenograms of the chests of infants during the first two weeks of life. In the stillborn infants there is a uniform density throughout the chest, hence there is no evidence of air. With respiration, air is found to enter the lungs, the stomach and the intestines. From five minutes to two weeks are required for the lungs to become fully expanded. Roentgenographically the bases are the last to expand completely.

From experimental studies, Meyer and Adler[167] found that urobilin excretion in the newborn does not depend upon the presence or absence of tissue icterus, but indicates a functional disturbance of the liver. If deviations from the normal are found in the bile pigment relations there is a disturbance in the function of the liver cells. The origin of urobilin in the newborn is exclusively in the liver.

From a very careful study of 100 autopsies on newborn babies, Sänger[168] concludes that no mechanism of labor is as dangerous to the child as the delivery of the after-coming head. Of 23 children delivered feet first that came to autopsy, only three failed to show tentorial lacerations and only one failed to show intracranial hemorrhage. Forceps also cause their quota of damage, but of all the types of forceps the Kielland is the least harmful. In the cases of cerebral hemorrhage the greatest portion of the free blood came from tears in branches of the tentorial veins. Large hemorrhages into the brain substance itself were never found; but Fischer[169] who has systematically studied 500 brains of newborn babies, maintains that hemorrhage into the brain is very common. These hemorrhages produce injuries to the brain in the children which survive. Schwartz[170] had previously reported that 65 per cent of all infants up to five months of age that came to autopsy showed brain injuries macroscopically and these injuries Fischer attributes to the trauma of labor. Of all the newborn babies that came to autopsy more than 95 per cent showed damage to the brain. Sharpe and Maclaire[171] performed spinal puncture in 100 consecutive newborn babies and found evidence of intracranial trauma in 10 per cent. Only the mildest signs of the intracranial condition were present in this series, hence the condition would probably have been overlooked had the routine lumbar puncture not been performed. The authors advise early and repeated lumbar puncture, except in shock, for early cases of cerebral hemorrhage and cerebral edema.

Among 157 babies whose eyegrounds were examined within 24 hours after birth by Jacobs,[172] 12.1 per cent showed retinal hemorrhage and the same incidence was found among 33 babies examined after the first day of life. Forty-two per cent of the babies with hemorrhage had been delivered with forceps but since 43.9 per cent of all the babies in the series were delivered with forceps the latter did not produce any undue injury.

Browne[173] who has had an extensive experience performing autopsies on stillborn babies again writes on the subject and because of the large number of deaths from asphyxia, stresses particularly the importance of watching the fetal heart rate during the second stage of labor. He favors routine induction of labor in primiparae about 10 days before the expected date of delivery, unless the baby is small and emphasizes the danger of breech delivery especially in primiparae. Prophylactic external cephalic version is, therefore, necessary in breech cases. Special provision should be made for premature babies.

A baby which presented by the breech was delivered by cesarean section and was found to have a wry-neck. On the left side of the baby's neck was a marked depression resulting from atrophy of the muscles. The left shoulder fitted snugly into it. In this case Stern[174] rules out the theory that torticollis is due to birth injury and intrauterine myositis. The position of the fetus during pregnancy and 48 hours of labor pains explain the deformity.

On the basis of three personal cases of congenital skin defects of the scalp and a review of the literature, Walz[175] condemns the amniotic origin of these defects. He believes these defects like harelip and syndactilism have an endogenous origin and show the following etiologic progressive steps—acrania, hemicrania, encephalocele, congenital defect of the scalp. Heidler[176] also reports a case of congenital defect of the scalp in a fullterm living baby and like Walz waives aside the theory of amniotic adhesions in favor of a primary inhibition of unknown origin.

A case of maceration of the skin in a living newborn child is reported by Koerting.[177] The skin defect was probably due to rupture of numerous large and small vesicles. By the ninth day the skin was smooth. The Wassermann reaction of both mother and child was negative. Another case of congenital skin lesion in a living child was reported by Voron and Bouirer.[178] This child was one of twins but the second fetus was a fetus compressus. The skin defects in the living child resembled huge burns and were symmetrical, which caused the authors to conclude there must have been a central nervous origin for the lesions.

Boorstein[179] believes that obstetric brachial paralysis is due to stretching or tearing of the cervical roots of the brachial plexus, nearly always associated with difficult labor. Vertex presentations predominate and the upper arm lesion is much more frequent than the lower arm type. Mild cases treated early and properly show recovery in three to four months and operative interference is indicated when there is no improvement after four months.

It is the contention of Guirauden[180] that intrauterine fetal death can be recognized by a study of coagulability of the mother's blood. An increased coagulability, especially if the coagulation time approaches 5 minutes, indicates fetal death, but this test is only of value in the last three months of pregnancy.

Among 53 babies examined by Raisz,[181] 61.9 per cent showed a positive reaction for blood in the stools and these babies appeared just as normal as babies without blood in the stools. This occult intestinal bleeding may be considered physiologic and the difference between this and melena neonatorum is only a quantitative one. The physiologic bleeding changes to melena when endogenous defects or exogenous factors, such as syphilis, sepsis, and birth trauma are added.

PLACENTA

Talbot[182] reports 20 consecutive cases of deformed babies where evidence of placental damage near the base of the cord was found and this is concomitant with his theory that infection produces hemorrhage in the placenta, which in turn is recorded on the edge of the placenta by a white infarct or cessation of the growth at that point. Talbot points out that Greenhill's observation of the frequent association of deformed babies with placenta previa contains important confirmatory

evidence of his own theory. The author believes that the early damage to the placenta is the cause of both the deformity and the previa.

Fifty syphilitic placentas were studied by Mönckeberg and Aviles[183] and of the patients from whom these placentas were obtained 82 per cent had positive Wassermann reactions. All the placentas were pale, edematous and friable and in half the cases tore during delivery so that pieces were retained in the uterus. Endarteritis and endophlebitis were found in 80 per cent of the specimens and in 62 per cent there was a considerable increase in the size and number of blood vessels due to the formation of collateral circulation. In an embryo expelled before the fifth month it is difficult to find spirochetes, which means that the fetus did not die from the effects of syphilis on its organs but from the effects of syphilis on the placenta. The authors could not find spirochetes in the placenta.

For the general term "angioma of the placenta," Scott[184] is inclined to favor the term chorioangioma fibrosum, the origin of which is the chorionic villi. Siddall[185] uses the term choriangiofibroma for this condition and in addition to a case report gives an extensive review of the literature. Clinically these tumors are important because they tend to produce polyhydramnios.

MISCELLANEOUS

In a medical review of the question of contraception, Dickinson[186] calls attention to the fact that the medical profession is not yet cognizant of any guaranteed contraceptive; but he advocates the simple "nonoperative" sealing of the fallopian tubes by means of the electric cautery. Irradiation of the ovary requires further experiments on dosage, on possible damage to future progeny and risks of abortion. Dependence on the plain douche and any douche alone is largely discredited. Doctors and educated couples in America rely largely on the sheath.

According to Mosher[187] the midwife may be eliminated as a factor in the solution of the question of the continued high rate of maternal mortality in this country. The causes operating to lower the standard of the work of the general practitioner are insufficient training in our medical schools, lack of hospital postgraduate training, lack of appreciation of the fact that the process of labor is not surgical, and lack of dependence on the obstetric specialist for diagnostic counsel rather than on the young surgeon.

In speaking of the relation of obstetrics to preventive medicine, Studdiford[188] emphasizes not only the importance of prenatal care but also the great value of a competent social service department. He also shows the necessity of careful supervision and treatment of mothers in the nonpregnant state as well as during pregnancy.

According to Strümpell there are four forms of therapy, namely, necessary, useful, unnecessary, and injurious. Before Semmelweis and Lister, a necessary procedure, such as forceps delivery or version and extraction, became a harmful procedure because of the impossibility of preventing infection. Liepmann[189] maintains that forceps operations done for convenience, version in a contracted uterus, version or perforation on a dead child without a maternal indication are examples of unnecessary and occasionally injurious procedures. A good example of useful therapy is painless labor. Twilight sleep, however, as far as the child is concerned, often makes of useful therapy a harm-

ful one. Immediate delivery of eclamptic patients and cesarean section in placenta previa are necessary therapeutic measures.

A review by Goodman[190] of 1,000 consecutive unselected cases showed far better results than those offered by Potter even though many of these patients were delivered by internes and many had been manhandled before being sent to the hospital. The author believes that in cases of tuberculosis where an abortion is necessary, a hysterectomy should be performed at the same time.

From a study of the confinements during the past year in the Montreal Maternity, Chipman[191] concludes that labor is a physiologic process if the woman is let alone. A woman who has suffered from eclampsia should in any subsequent pregnancy spend the last trimester in bed. Postpartum hemorrhage is practically a thing of the past for the author never hurries the third stage. Early delivery should be effected in placentia previa.

At the Rotunda Hospital, Theobold[192] never washes his hands before putting on gloves if they are socially clean, as a preliminary to the manual removal of a placenta or putting on low forceps; but he always prepares his hands if bullet forceps or mutilating operations are necessary. According to Bigger,[193] for the majority of procedures used in obstetrics it is quite unnecessary to bother about the condition of the hands beneath the gloves and if a glove becomes contaminated it can be both easily and quickly sterilized by washing with soap and water, followed by biniodide of mercury 1-1000 for one minute.

BIBLIOGRAPHY

(130) *Emge:* AMER. JOUR. OBST. AND GYNEC., 1924, vii, 16. (131) *Fischmann:* Surg., Gynec. Obst., 1924, xxxix, 327. (132) *Rudolphson:* Zentralbl. f. Gynäk., 1924, xlviii, 344. (133) *Kanter and Pilot:* Surg., Gynec. and Obst., 1924, xxxviii, 96. (134) *Heusler-Edenhuezen:* Zentralbl. f. Gynäk., 1924, xlviii, 2472. (135) *v. Büben:* Zentralbl. f. Gynäk., 1924, xlviii, 1310. (136) *Vinges:* Lé Concours Médicale, 1923, Oct. 14, 3194. (137) *Ruge:* München. med. Wchnschr., 1921, lxviii, 1072. (138) *Heidler:* Arch. f. Gynäk., 1924, cxxxi, 429. (139) *Costain:* Brit. Med. Jour., 1924, 3332, 857. (140) *Mitchell:* Brit. Med. Jour., 1924, 3314, 36. (141) *Edwards:* Surg., Gynec, and Obst., 1924, xxxviii, 256. (142) *Newman:* Jour. Kansas Med. Soc., 1924, xxiv, 263. (143) *Mansfeld:* Monatschr. f. Geburtsh. u. Gynäk., 1924, lxv, 286. (144) *Canney:* Brit. Med. Jour., 1924, 3322, 356. (145) *Corby:* Brit. Med. Jour., 1924, 3326, 557. (146) *Ford:* Brit. Med. Jour., 1924, 3327, 623. (147) *Mayer:* Arch. f. Gynäk., 1924, cxxii, 168. (148) *Bailey:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 7. (149) *Bock:* Deutsch. med. Wchnschr., 1924, l, 340. (150) *Gellhorn:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 535. (151) *Eichel:* AMER. JOUR. OBST. AND GYNEC., 1924, vii, 667. (152) *Fruhinsholz and Francais:* Bull. de la Soc. d'Obstét. et de Gynéc., 1924, xiii, 670. (153) *Keene and Hewer:* Lancet, 1924, ccvii, 2, 111. (154) *Musselman:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 45 and 141. (155) *Müller:* Jour. Am. Med. Assn., 1924, lxxxiii, 208. (156) *Williamson and Taylor:* Jour. Am. Med. Assn., 1924, lxxxii, 1107. (157) *La Vake:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 99. (158) *Szenes and Mondré:* Zentralbl. f. Gynäk., 1924, xlviii, 2117. (159) *Driessen:* Jour. Am. Med. Assn., 1924, lxxxiii, 161, (Abstract). (160) *Pemberton:* Surg., Gynec. and Obst., 1924, xxxix, 207. (161) *Spillman:* AMER. JOUR. OBST. AND GYNEC., 1924, vii, 110. (162) *Matthews:* Surg., Gynec. and Obst., 1924, xxxviii, 383. (163) *Skinner:* Jour. Am. Med. Assn., 1924, lxxxii, 1190. (164) *Peterson and Miller:* Jour. Am. Med. Assn., 1924, lxxxii, 234. (165) *Evans:* Surg., Gynec. and Obst., 1924, xxxix, 494. (166) *Wasson:* Jour. Am. Med. Assn., 1924, lxxxiii, 1240. (167) *Meyer and Adler:* Zentralbl. f. Gynäk., 1924, xlviii, 1514. (168) *Sänger:* Monatschr. f. Geburtsh. u. Gynäk., 1924, lxv, 258. (169) *Fischer:* Schweiz. Med. Wchnschr., 1924, liv, 905. (170) *Schwartz:* München. med. Wchnschr., 1922, lxix, 1110 and 1431. (171) *Sharpe and Maclaire:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 172.

(172) *Jacobs:* Jour. Am. Med. Assn., 1924, lxxxiii, 1641. (173) *Browne:* Edinburgh Med. Jour., 1924, xxxi, 177. (174) *Stern:* Monatschr. f. Geburtsh. u. Gynäk., 1924, lxv, 179. (175) *Walz:* Monatschr. f. Geburtsh. u. Gynäk., 1924, lxv, 167. (176) *Heidler:* Wien. med. Wchnschr., 1924, xxxvii, 114. (177) *Koerting:* Ztschr. f. Geburtsh. u. Gynäk., 1924, lxxxvii, 475. (178) *Voron and Bourier:* Bull. de la Soc. d'Obstét. et de Gynéc., 1924, xiii, 656. (179) *Boorstein:* Jour. Am. Med. Assn., 1924, lxxxii, 862. (180) *Guirauden:* Bull. de la Soc. d'Obstét. et de Gynéc., 1924, xiii, 748. (181) *Raisz:* Zentral. f. Gynäk., 1924, xlviii, 1550. (182) *Talbot:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 271. (183) *Mönckeberg and Avilés:* Gynécologie et Obstétrique, 1924, ix, 419. (184) *Scott:* Surg., Gynec. and Obst., 1924, xxxix, 216. (185) *Siddall:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 430 and 554. (186) *Dickinson:* AMER. JOUR. OBST. AND GYNEC., 1924, viii, 583. (187) *Mosher:* AMER. JOUR. AND GYNEC., 1924, vii, 294. (188) *Studdiford:* Boston Med. and Surg. Jour., 1924, exci, 617. (189) *Liepmann:* Deutsch. med. Wchnschr., 1924, l, 455. (190) *Goodman:* AMER. JOUR. OBST. AND GYNEC., 1924, vii. (191) *Chipman:* Canadian Med. Assn. Jour., 1924, xiv, 704. (192) *Theobold:* Jour. Obst. and Gynec. of Brit. Empire, 1924, xxxi, 54. (193) *Bigger:* Jour. Obst. and Gynec. of Brit. Empire, 1924, xxxi, 60.

Selected Abstracts

Malignant Neoplasms

Salvador, Jaime: Vaginal Colpohysterectomy for Cervical Carcinoma. Semana Medica, 1923, xxx, 133.

The author describes a new operation for cervical cancer in cases in which the lower uterine segment still is intact though its mucosa might already be affected. The operation precludes a dissemination of cancer cells into the pelvic connective tissue and the vaginal walls.

Eight days before the contemplated radical operation he destroys with curette and actual cautery the tumor mass. In his opinion this procedure retards karyokinesis in the cancer tissue and reduces the virulence also of the bacteria. At this time furthermore an attempt is made to determine exactly whether the lower uterine segment still is free from cancerous invasion.

This latter examination is repeated on day of operation. Cervix is painted with iodine and tampon placed into vagina. After abdominal incision, with patient in Trendelenburg position, once again it is ascertained whether extension of carcinoma does not contraindicate radical Wertheim operation. The successive steps are as follows: ligation of infundibulopelvic ligaments, of round ligaments close to uterus, dissection of mesosalpinx and broad ligaments, leaving only enough for peritonealization; transverse section of peritoneum anteriorly about one to two cm. above vesicouterine pouch, separation of bladder. Careful dissection of pelvic portions of ureters with preservation of nutrient vessels. Ligation of uterine arteries close to pelvic wall, double ligation (proximal and distal) of sacrouterine ligaments with transverse splitting of peritoneum posteriorly, a little below isthmus. If lower uterine segment on direct inspection is found sound, a supravaginal amputation of uterus is made (knife, scissors or thermocautery).

The remaining lower uterine portion then is removed with the help of a special instrument, called Uterine Inversor. It is 55 cm. long and consists of two separable parts (see Fig. 1). It is introduced from above, the handle passing into the vagina from which the tampon had been removed (Fig. 2). With an assistant exerting traction on the handle from below the operator sees that

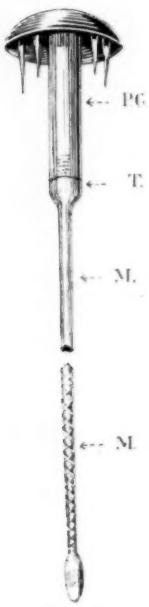


Fig. 1.

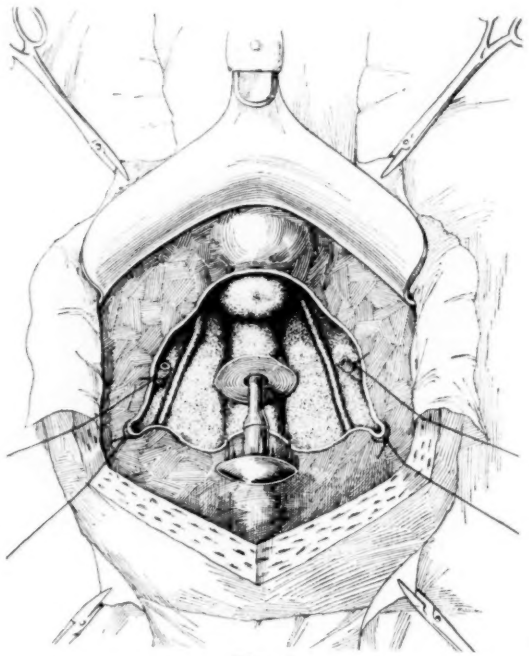


Fig. 2.

Fig. 1.—*P.C.* cervical portion; *M.* handle of instrument; *T.* handle screws into the cervical portion here; *M'.* vaginal portion of the handle.

Fig. 2.—(Semi schematic.) The body of the uterus, the adnexa, and the parametrial tissues have been removed. The handle of the inverting instrument has been pushed down through the vagina and is grasped by an assistant, who pulls gently downward while the surgeon guides the sharp prongs into the wall of the cervix.

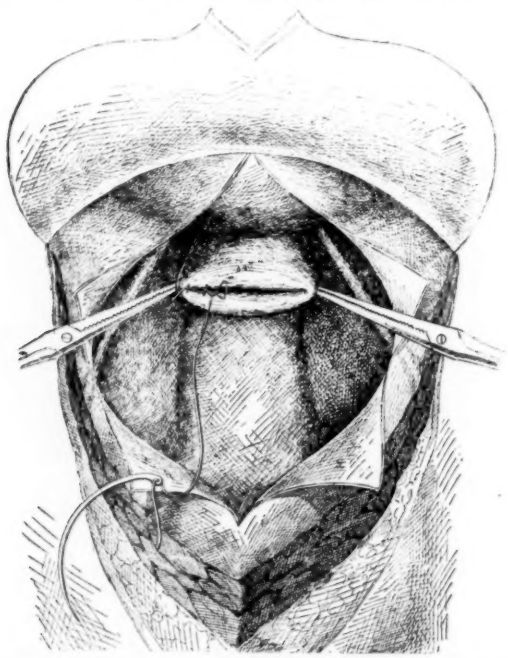


Fig. 3.—The cervix and upper part of the vagina having been inverted into the vagina, the vagina is now tightly closed by a continuous suture of chromic catgut.

the five sharp prongs sink into the musculature of the cervical stump. While the assistant with gentle traction inverts cervical stump and upper portion of vagina (a clamp being placed on either side, as shown in Fig. 3) abdominal operation is completed in usual manner after removal of all suspicious looking lymph glands.

Vagina is carefully cleansed with 95 per cent alcohol, and inverted portion of vagina divided a few cm. below cervicovaginal junction. The wound is closed with continuous catgut suture (Fig. 3) and once more vagina cleansed with 95 per cent alcohol followed by saline douche.

The chief advantage of this method devised by Salvador in his belief lies in the elimination of any possible dissemination of cancer cells. J. M. PIERCE.

Roussiel, Marc: Preventative Hemostasis in Radical Hysterectomy for Cancer by Ligature of the Hypogastric Arteries. La Presse Médicale, Dec. 1, 1923, p. 1005.

This procedure was first proposed by H. A. Kelly in 1894, and has since been advocated by many other writers. The author has employed it in 40 cases with entire satisfaction, there was practically no shock, and the loss of arterial blood was negligible. These points are of especial importance in anemic or cachectic patients. A study of the anatomy of these vessels and of their anomalies has led the author to advocate and practise the following technic:

1. Ligation of the right hypogastric artery. The infundibulopelvic ligament is made tense by the application of two artery forceps to its superior border, and an incision is made with scissors between the forceps. The lips are separated by blunt dissection, and the ureter remains adherent to the internal fold. Excessive denudation is avoided, in order to obviate injury to the artery of the ureter, which usually arises from the external iliac on the right and from the common iliac on the left. The hypogastric artery is carefully separated by blunt dissection from the internal and external iliac veins and their tributaries, and is ligated about 2 cm. from its origin, the ligature being passed with a Deschamps needle. If there is a low insertion of the cecum, this organ is displaced after section of the parietal peritoneum on its external border.

2. Ligation of the left hypogastric artery. If the pelvic mesocolon is long, the vessel is ligated by section of the the infundibulopelvic ligament as on the right side. If the mesocolon is short, the intersigmoid fossa and the secondary root of the mesocolon are exposed by lifting the sigmoid upward and outward. An angular incision is made, one leg of which is through the inner layer of the mesocolon, the other leg is through the pelvic peritoneum parallel to the common iliac artery and the external iliac vessels. The ovarian vessels are now sectioned between forceps. The deep layer of the retrocolic fascia is next incised, and the vessels and the ureter are exposed. The actual ligation of the vessel is performed as on the right side.

This preliminary ligation assures not absolute, but only relative, freedom from bleeding from the uterine and the vaginal arteries, hence they are ligated also. There is no danger of necrosis of the bladder, nor is there an increased liability to infection, as has been charged by some, because of free anastomoses between arterial branches above and below the point of ligation. In addition, the nutrition of the bladder is provided for by a reflux of blood through the branches of the hypogastrics below the ligatures into the vesical arteries.

The author feels that this procedure is especially useful in operations on stout women, also on those with deep pelves or with extensive parametrial lesions. He lost only two very cachectic patients out of the 40 operated upon, and states that

J. L. Faure's best results have been achieved in the series of cases in which he practised this ligation.

Halban: Abdominal and Vaginal Operation for Carcinoma. Zentralblatt für Gynäkologie, 1923, xlvii, 1480.

The writer has collected his cases since 1910, having operated alternately by abdomen and vagina. The material between 1910 and 1918 consisted of 374 cases, of which 157 were operated upon—77 by laparotomy, and 80 by the vaginal route. The results so far as cures were concerned were identical, though the primary mortality after laparotomy was practically twice that after operation by the vaginal route. Injuries to the bladder, ureters, and rectum were much more numerous in the cases done by abdominal section. It would appear that the individual malignancy of various cases of carinoma has more to do with the end-results than has any form of operation. The abdominal and vaginal routes are absolutely of equal value, and it is possible that a combination of the two may in certain cases improve results. In certain cases with a cardiac or lung complication, the vaginal method is usually less dangerous and can be undertaken with local anesthesia. This, however, implies the necessity for good vaginal technic which becomes less frequently noted among the younger gynecologists.

LITTLE.

Gosset and Monod: Indications for Surgery in the Treatment of Uterine Cancer. Paris Médical, 1924, xiv, 158.

While the treatment of cancer of the cervix has undergone a radical change since the employment of the x-ray and of radium has been perfected, these authors feel that the treatment of cancer of the body of the uterus remains strictly surgical. There remain certain indications for surgical intervention in cases of cancer of the cervix. Among these, Gosset and Monod enumerate the following: Atresia of the vagina or even of the cervical canal; ankylosis of the hipjoints or other reasons why the vagina is inaccessible; coexisting infections. In the case of pyosalpinx in the presence of advanced carcinoma, they have found it expedient to remove the former and apply radiation afterwards. They have also found that an induration which was supposed to be an extension of the carcinoma sometimes disappears after such an operation, making the case appear more favorable than at first. In operable cases, they prefer to apply radium four or six weeks before operation. In removing such uteri after a thorough application of radium they have, in 17 cases, found unchanged cancer nests in the surrounding tissue. For this reason, the authors have come to the conclusion that, except in far advanced cases, the best results are obtained by combining radium and surgery.

R. E. WOBUS.

Opitz, E.: The Results of Cancer of the Female Genitalia after Irradiation. Medizinische Klinik, 1923, xix, 1215.

While there is no doubt that x-ray and radium kill the cells upon which they act, the problem of treating cancer by x-ray and radium is not simple because we must try to prevent damage to the tissue immediately surrounding the cancer and we must also avoid systemic danger. Histologic examination of cancer cells subjected to irradiation does not reveal the biologic effects which result from the irradiation. It is well known that disturbances in one group of cells (by irradiation or otherwise) produce an effect on the entire organism.

From his own experience and from that of others, Opitz claims the following

statements are true: The result of direct irradiation of a carcinoma has no direct relationship to the dosage used. Occasionally one finds a nest of very active carcinoma cells in completely necrotic connective tissue, the result of irradiation. Since connective tissue cells are more resistant than carcinoma cells (epithelial cells) we here have an example of carcinoma cells resisting even a high so-called carcinoma dose. Nearly all cancers except those of the female genitalia, the skin and the thyroid, show very poor results from irradiation. Isolated cancer cells cannot be killed even with ten times the so-called cancer dose; for they become active again when implanted. Hofbauer obtained the same results in vulvar carcinoma by irradiating the hypophysis as he did by direct irradiation. The results of irradiation are better when the neighboring tissue is irradiated at the same time. Increasing the dose does not result in hastening the healing but rather retards it. Local treatment is, therefore, not as important as some believe. Under the influence of irradiation a change takes place in the body which prevents the further growth of cancer and destroys the cancer cells. The results are essentially the same whether irradiation is local or general.

Irradiation causes a chemical substance to be found all over the body but most of it is found at the site of formation. This explains the apparently local effects of irradiation. The presence of this chemical substance has been shown by Behme.

Instances have been seen where after treatment patients had remained well for years and then the cancer cells which had remained dormant became active again and killed the patients.

Seitz believes in the employment of a definite dose for carcinoma of the uterus because he does not believe in a biologic conception of carcinoma. Opitz discards the idea of a carcinoma dose because he considers not alone the carcinoma but the entire sick individual. Opitz does not think that there is such a thing as a stimulating dose of irradiation for carcinoma and hence does not fear to use small doses of x-ray and await results. On the other hand, too large a single dose may kill the patient. Death in such a case is due to the sudden liberation of the products of carcinoma necrosis before an immunity has been established.

J. P. GREENHILL.

Pfeiffer, J.: Metastases of Carcinoma of the Uterus to Bartholin's Gland. Archiv fuer Gynaekologie, 1923, cxx, 305.

This is the second case reported of metastases to Bartholin's gland of carcinoma originating in the uterus. The patient was a para-iv, sixty-one years old. The connective tissue of the gland was split by abnormal cell rests, consisting of large, irregular, polygonal cells rich in plasma but without any intercellular substance. The tumor tissue penetrated into all the surrounding structures.

RALPH A. REIS.

Burckhard: The Simultaneous Occurrence of Carcinoma of the Uterus and Ovaries. Zeitschrift für Geburtshülfe und Gynäkologie, 1924, lxxxvii, 350.

From a review of the literature, and a careful consideration of the anatomic relations in both lymphatic and blood stream metastasis, the author believes that in his own case, and usually, the primary seat of the disease is in the uterus, while the ovaries are secondarily affected. The reverse may, however, hold true in some cases, and rarely the two carcinomata may be independent.

MARGARET SCHULZE.

Schmitt: Squamous Cell Carcinoma of the Corpus Uteri. Zeitschrift für Geburtshülfe und Gynäkologie, 1924, lxxxvii, 373.

The author describes a squamous cell carcinoma of the corpus uteri occurring in conjunction with a squamous cell carcinoma of the vulva in a woman of 71 years. The uterus showed a marked hydrometra and was lined by a smooth membrane of squamous epithelium which, in its upper portion, had taken on characteristic malignant changes, while in the lower part only a metaplasia into atypical many-layered squamous epithelium without demonstrable malignancy was present. There was no area in which the carcinoma had destroyed the uterine wall in any considerable measure, so that it could be spoken of as a primary focus, there was therefore no justification for the assumption that the carcinoma had spread out flat over the endometrial surface from such a primary focus. Against the possibility that the carcinoma had spread up from the vulva is the fact that the changes in the lower portions of the uterus were nonmalignant while the epithelium in the upper portions was definitely carcinomatous.

The author, therefore, believes that he is dealing with a primary uterine squamous cell carcinoma arising in metaplastic epithelium, thus agreeing with Hitschmann's theory of the origin of these tumors. MARGARET SCHULZE.

Shaw, Wm. Fletcher: Carcinoma of the Female Urethra with Notes of Two Cases Treated with Radium. The Journal of Obstetrics and Gynaecology of the British Empire, 1923, xxx, 215.

One hundred cases were found in the literature. The disease usually occurs in women over forty and commences in the urethral mucous membrane or in the epithelium above the meatus. The lesion may be found as an ulcer, polypus or infiltration. The common symptoms are irritation of the vulva and painful micturition. The inguinal glands are involved in one third of the cases. Of the cases reported thirty were treated by total resection of the urethra in some of which a portion of the bladder base was sacrificed. Twelve women had urinary control after this operation. The results were unsatisfactory as regards recurrence but better than those after partial resection with retention of the internal sphincter.

Two cases treated by the author with radium were comfortable and without signs of local recurrence two months and three years respectively after initial applications. H. W. SHUTTER.

Gerich, O.: The Early Diagnosis of Uterine Carcinoma. Medizinische Klinik, 1923, xix, 1292.

The early stage of carcinoma of the uterus includes those cases in which carcinoma cannot be recognized macroscopically and secondly, those cases in which carcinoma can be recognized macroscopically but which are strictly localized. A symptom which should make one suspect carcinoma is bleeding after coitus. This may occur not only in carcinoma of the cervix but also in carcinoma of the fundus without involvement of the cervix. Other suspicious symptoms are bleeding during the menopause and bleeding on urination and defecation. Bleeding which is independent of ovarian function and which occurs between the periods should arouse suspicion, although this may be due to other causes.

Zweifel stresses obstinate leucorrhea and pruritus vulvae as important symptoms. Every cervical erosion which bleeds easily should be excised and examined. Occasionally a carcinoma of the portio may resemble a nabothian follicle. In

such cases the follicle should be punctured. If mucus appears the cyst is benign, but if blood is seen, the cyst should be removed for microscopic diagnosis.

The author reports six cases of early carcinoma of the uterus in which he performed the radical operation. In three of the cases there was no atypical bleeding and in none did any of the symptoms arouse suspicion of carcinoma. Many cases of carcinoma in the climacterium go unrecognized not only because the patients pay no attention to the symptoms but also because many physicians believe bleeding at this stage of life is without significance. J. P. GREENHILL.

Murphy, Douglas P.: Endotheliomata of the Uterus. Surgery, Gynecology and Obstetrics, 1923, xxxvii, 24.

The author reports a case and reviews 48 cases from the literature of that malignant pathologic process designated as endothelioma in which the uterus has been the site of origin. Primary involvement of the ovary seems to occur twice as frequently as that of the uterus.

Diagnosis can only be made from histologic specimens, no pathognomonic symptoms nor characteristic gross lesions can be demonstrated. Excellent photomicrographs accompany the article and demonstrate the alveolar arrangement of unequal-sized cells grouped about a small blood-vessel, together with occasional giant-cell formation. CREADICK.

Forsdike, S.: The Early Diagnosis of Cancer of the Cervix. The Clinical Journal, London, 1924, liii, 126.

One out of every 1100 cancers of the cervix occurs in women below twenty years of age, one in every five cases between thirty and forty years of age, and one out of every twenty-eight between the ages of twenty and thirty. The usual signs of carcinoma of the cervix are hemorrhage, offensive discharge, pain and wasting. Offensive discharge is due to sloughing and necrotic tissue, pain is due to an involvement of parametrium and adjacent nerve roots, wasting to the results of a toxemia from the absorption from an infected ulcer and the consequent malnutrition, hence all these signs are late symptoms leaving only hemorrhage as an early symptom. Every woman having any irregularity of vaginal bleeding should be investigated thoroughly, the cervix should not only be palpated but should be directly inspected. If a question at all arises as to its condition, a biopsy is necessary to avoid any possible mistake. Hemorrhage occurs as soon as an ulcer has formed and the surface begins to break down. At first it is very superficial and the bleeding is slight, hence is usually neglected. Friability of tissue is a late sign. A. C. WILLIAMSON.

Moebule, W.: Papilloma of the Portio. Archiv fuer Gynaekologie, 1923, cxix, 373.

The author reports this case because of its rarity, the differential diagnosis and the question of recurrence. The patient was 4 months pregnant when she developed vaginal bleeding with chills and fever. A small, soft, bright red, wart-like structure, 0.5 cm. in height, was removed from the anterior portion of the portio by cutting it flush by means of a pair of scissors. Six weeks later the tumor was the size of the end of a man's thumb and was removed by means of a wedge-shaped incision. Microscopic examination showed papillomatous structure but no malignant changes. The author regards it as the third stage of healing of a cervical erosion. The sections, however, showed the papillomatous formation to be due to the substitution of pavement epithelium for glandular epithelium. RALPH A. REIS.

Veit: A Contribution to the Statistics of Vulvar Sarcoma. Zeitschrift für Geburtshülfe und Gynäkologie, 1924, lxxxvii, 422.

The author gives a short review of the literature and cites in detail and illustrates a case of nonpigmented polymorph-celled sarcoma of the labium majus occurring in a spinster fifty-three years of age. MARGARET SCHULZE.

Hinselmann: Proliferative Processes in the Center of Hydatid Mole Villi. Zeitschrift fur Geburtshülfe und Gynäkologie, 1921, lxxxiii, 313.

The author describes a peculiar type of large, deeply staining cells, frequently found surrounding the central fluid cavity of the villi in hydatid moles. He considers them as identical with similar large cells previously described by Chaletsky and Neumann and derived by Neumann from the syncytium. He disagrees with Neumann, however, concerning their origin, and builds up an elaborate proof which indicates that they represent merely hypertrophied and hyperplastic stroma-cells. MARGARET SCHULZE.

Frey, E.: A Case of Hydatidiform Mole in a Woman Just Before the Menopause. Schweizerische Medizinische Wochenschrift 1922, lii, 201.

Cases are reviewed from literature in which chorionepithelioma developed after the removal of a mole. The author's patient was a women fifty-one years old who missed a period and two months later had irregular bleeding. One month later a curettage was done and the diagnosis of hydatid mole was made. Ten weeks after the curettage she again had irregular bleeding and at this time the cervix was dilated and a mass as big as a walnut was found in the fundus. Hysterectomy was performed and the pathologist returned a report of chorionepithelioma of the uterine fundus. From such a case the importance of histologic examination is noted as well as the fact that all cases which have been curetted for mole should return at a later date for examination to guard against malignancy developing. A. C. WILLIAMSON.

Nichols: Benign Decidual Tumors of the Uterus. American Journal of the Medical Sciences, 1920, clx, 697.

A discussion of the varieties, sources and clinical characteristics of these tumors, with the report of ten cases, is summarized by the author, as follows: Tumors exhibiting decidual characteristics may develop during the period of gestation, appearing either as polyps protruding from the os or as intrauterine tumors found at the time of parturition. Although their microscopic appearance somewhat resembles epithelioma (or endothelioma), they are strictly benign and should not lead to needless radical operation. Whether they originate from the decidua *de nova* or are previously existing tumors that have undergone decidual transformation cannot be finally stated; the former seems probable. The identification of the decidual character of such polyps is an indication of the existence of pregnancy. J. WARREN BELL.

Miller: Extra Genital Chorionepitheliomata of Congenital Origin. The Journal of Obstetrics and Gynaecology of the British Empire. 1922, xxix, 48.

The author reports in detail a case of chorionepithelioma occurring primarily posterior to the liver of a male thirty-nine years old. Autopsy showed the genitalia to be negative. Sections of the tumor mass revealed villous structures surrounded by layers corresponding to the Langhans and syncytial cell layers

of the placenta. The villi contained no vascular structures. Sections of the fibrous tumor coat showed these villous structures in, and perforating, the blood-vessel walls of that structure. No tumor growth could be found in the lungs but the arteries of that organ contained free tumor cells and others encapsulated in protective thrombotic processes.

Four theories as to the origin of such tumors are given: (1) the growth arises from an included embryo or twin of the host. (2) the growth springs from an included zygote; (3) it arises from an included somatic cell; (a) capable of giving rise to any type of cell, (b) capable of giving rise to ectoderm or entoderm alone, and (4) the tumor has its origin in a primitive germ cell and develops by parthenogenesis. The latter origin is the most likely in the case reported.

A testicular source for the tumor is excluded. The primary tumor sprang from an abnormally situated germ cell producing a teratoma with all embryonic layers. The stimulus for growth probably came from the surrounding tissues, possibly augmented by the altered internal secretions of adult life. H. W. SHUTTER.

Solomons: Primary Chorionepithelioma of the Fallopian Tube. The Journal of of Obstetrics and Gynaecology of the British Empire, 1923, xxx, 162.

A primary chorionepithelioma of the tube is reported with complete operative and autopsy findings. No signs or history of a preceding pregnancy either in the uterus or tube existed. Metastasis was found to have occurred in the anterior vaginal wall at the time of operation, and in the lungs at autopsy. The literature on this type of tumor is meager. The characteristic symptoms are those of an ectopic pregnancy possibly followed by a period of rest and ending in the rapid development of the tumor with pain and cachexia. Four theories of origin are held: first, an origin secondary to pregnancy in the tube (usual cause); second, as an embryoma; third, deportation of villi, and lastly devitalization of the egg cell. H. W. SHUTTER.

ERRATUM

In the article by Greenhill, March issue, p. 428, fourth paragraph, the name B. C. Hirst should have read J. C. Hirst.

Book Notices

MEDICAL EDUCATION. A COMPARATIVE STUDY. By Abraham Flexner. The Macmillan Co., New York. 1925.

ON THE BREAST. By Duncan C. L. Fitzwilliams, Surgeon in Charge of Out-Patients and Lecturer on Operative Surgery to St. Mary's Hospital, etc., etc. St. Louis, C. V. Mosby Co. 1924.

BIOLOGIE UND PATHOLOGIE DES WEIBES. Herausgegeben von Josef Halban und Ludwig Seitz. Urban und Schwarzenberg, Berlin und Wien, 1924. Lieferung 12.

THE EFFECTS OF INANITION AND MALNUTRITION UPON GROWTH AND STRUCTURE. By C. M. Jackson, Professor and Director of the Department of Anatomy, University of Minnesota. 117 illustrations. Philadelphia, P. Blakiston's Son & Co. 1925.

INFECTION, IMMUNITY AND BIOLOGIC THERAPY. By John A. Kolmer, professor of pathology and bacteriology in the graduate school of medicine, University of Medicine of Pennsylvania, etc. With an introduction by Allen J. Smith. Containing 202 original illustrations, 51 in colors. Third edition, thoroughly revised and mostly rewritten. Philadelphia, W. B. Saunders Co., 1924.

HANDBUCH DER GEBURTSHILFE. Herausgegeben von A. Doederlein, Muenchen, in drei Baenden und Ergaenzungsband. Zweite Auflage. Zweiter Band. Mit 213 Abbildungen im Yexy. Muenchen, J. Bergmann, 1924.

GYNAEKOLOGISCHE PSYCHOTHERAPIE. Von Dr. Wilhelm Liepmann, Professor der Frauenheilkunde, Universitaet zu Berlin. In 10 Vorlesungen mit 4 Kunstbeilagen. Berlin, Urban & Schwarzenberg, 1924.

MEDIZINISCHE PSYCHOLOGIE. Von Dr. Ernst Kretschmer, Privatdozent fuer Psychiatrie in Tuebingen. Mit 22 Abbildungen. Leipzig, Georg Thieme. 1923.

UEBER HYSTERIE. Von Ernst Kretschmer, Privatdozent fuer Psychiatrie, Tuebingen. Verlag von Georg Thieme in Leipzig, 1923.

INTERNATIONAL CLINICS. Volume I. Thirty-Fifth Series, 1925. Philadelphia, J. B. Lippincott Co. 1925.

PSEUDO-APPENDICITIS. By Thierry de Martel, et Edouard Antoine, Paris. Authorized translation from the French by James A. Evans. Illustrated with 41 engravings. Philadelphia, F. A. Davis Co. 1925.

DIE KONSTITUTION DER FRAU, und ihre Beziehungen zur Geburtshilfe und Gynaekologie. Von Dr. Bernhard Aschner, Privatdozent an der Universitaet Wien. Zweiter Band. Spezielle Konstitutionslehre. Muenchen, Verlag von J. F. Bergmann, 1924.

BIOLOGIE UND PATHOLOGIE DES WEIBES. Herausgegeben von Josef Halban und Ludwig Seitz. Lieferung 11. Berlin. Urban & Schwarzenberg, 1924.